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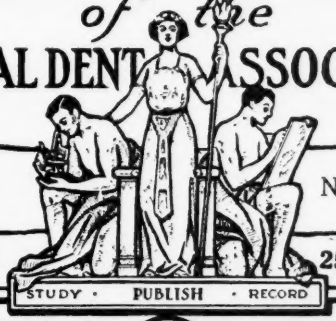

NOVEMBER, 1920

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WILLIAM G. EBERSOLE, M.D., D.D.S.
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THE JOURNAL
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Original Communications.

GRADUATE AND UNDERGRADUATE INSTRUCTION IN EUROPE AND AMERICA.

By ALFRED GYSI, D. D. S., Zurich, Switzerland.

(Read before National Association of Dental Faculties, Boston, August, 1920.)

THE pleasure which I naturally feel in appearing before this audience is greatly increased by the fact that my experience as a dental teacher in Europe leads me to look upon you gentlemen as a body thru whose efforts and direction the greatest advancement in dental education will be effected in the future. Perhaps I can best make plain the reason for this hope which I have in you by contrasting some of the conditions surrounding dental education in Europe with the conditions I understand obtain here and then telling you about some of the new and powerful forces which are coming to light over there and which may greatly change your lives and mine, not only in our teaching, but in other ways.

The University of Zurich is what you would call in this country a state university. It is operated under the direction of a Board of Education of the Canton of Zurich. In this university, the Dental College, now in its twenty-fifty year, is still conducted as an adjunct of the Medical Faculty.

Dental education is conducted under the authority of the medical law of 1850, to which a few additions have been made. The program of dental studies was arranged by the Dental Society of Zurich in agreement with the General Swiss Dental Society and accepted by the Board of Education. These studies were intended to place the dental profession upon a high intellectual and social plane and the program, when superficially examined, seems to be nearly ideal. Upon more intimate knowledge, however, it is

seen not to be so nearly perfect, and it is bringing about actions and reactions in which I am sure you will be interested and which you may sometime feel in this country if your own educational program is developed in like manner and the waves of social unrest which are now disturbing Europe ever beat strongly enough upon these shores.

The Academic Preparation.

Before a young man in Switzerland can enter the Dental College of the University of Zurich, he must spend nine years in the primary and grammar schools, four years in the High School, and take at least two years of general preliminary work in the university. This makes fifteen years of preliminary work, which, beginning at the age of seven, prepares him for the dental college at the age of twenty-two. He may then possibly graduate at the age of twenty-four with the title dentist or at the age of twenty-five with the title Doctor of Oral Surgery.

The Character of the Studies.

Let us now examine the studies of the collegiate period and their fitness to prepare the young man for his life work.

During the first year he must study botany, zoology, chemistry and physics and successfully pass the examinations.

At the end of the second year he must successfully pass examinations in anatomy, physiology, embryology and histology. Study in all of these subjects has been developed to a point where probably not more than six out of ten of the young men can successfully pass the examinations at the end of two years. Probably four out of ten are compelled to return and spend half a year or a full year additional to complete these subjects. For the most intellectual of the students, these preliminary subjects require two years and for others, from two and a half to three years.

The preliminary studies up to this point would be greatly improved if the teaching of botany, zoology, chemistry and physics were formulated in relation to dentistry or even to medicine, but such is not the case. The teaching upon each of these subjects is arranged for the student who wishes to specialize in that subject, that is, to make botanists, zoologists, chemists. It is not at all medical or dental in character, and the connection with medicine or dentistry is very slight in the student's mind. In like manner, the studies of the second year would be greatly improved for the dental student, if they were adapted to dental requirements, but they are not. They are purely medical in character and the young man preparing for dentistry is required to spend much of his time upon subjects with which he will never be occupied in dental practice and concerning which his knowledge will speedily fade away to nothing.

Headworkers and Handworkers.

Many years of observation have led me to believe that men may be divided roughly into two great classes, headworkers and handworkers, and that the great majority of men fall rather definitely into one class or the other, with not more than two or three in ten occupying the middle ground so that they can work well with both head and hands.

Far be it from me to decry the necessity for much intelligent headwork in dentistry, but I am sure you will admit that handwork is essential to the successful conduct of a dental practice and that our headworkers should be handworkers in at least sufficient degree to enable them to check up their findings and keep their teachings within the bounds of common sense.

A Preliminary Examination.

It seems to me that if we are ever to develop dentistry to the highest degree of which it is capable, there should stand, as the very front door of admission to the profession, an examination which

should show whether or not the applicant possessed any degree of hand skill, for if he has no hand skill, he is unsuited to practice, however, great may be his intellectual capacity. We should never forget that the performance of operations requiring a high degree of manual skill is essential to our service to the public. This examination might be of the simplest form, merely designed to give the young man an opportunity to show along what lines he found his boyhood pleasures. It might range from the making of a box or the whittling of a boat to the winding of an armature or the making of an aeroplane. Its object would be to show the possession of mechanical mental gifts and an aptitude of the hand with tools. Among the men who possess these gifts, there will be fine minds by whom the profession will be carried far forward. The others will have the ability to carry out the technic devised by the investigators and experimenters.

The young man in Switzerland who desires to practice dentistry has no opportunity to determine in advance his fitness for the profession. If he is to comply with the strenuous educational program, his time up to the age of 22 will have been fully occupied in the lower school, the High School, and the preliminary studies in the university.

Many of those who are best able to complete the preliminary studies at the university and who pass the examinations most successfully are least suited to the handwork of dentistry. These men have no chance to find this out until they have spent years of time and considerable sums of money in preparation.

Many of those for whom the preliminary studies and examinations have been most difficult are those best suited to the practice of dentistry. I feel sure that the severity of the preliminary studies and the examinations eliminates a great many young men who have the gift of handwork in large degree and the gift of headwork in less degree, but who would be extremely valuable in the routine practice of dentistry, perhaps in the smaller communities. I shall show you in a few moments that this conviction is not confined to my own mind.

The Degree of Doctor of Dental Surgery.

After the completion of the preliminary work described, the medical and dental students separate, going to the Medical and Dental Colleges. In the Dental College, the student completes the dental studies which require at least two years. These lead to the degree of Dentist, but not to the degree of Doctor of Dental Surgery. The degree of Doctor of Dental Surgery can be given only by the medical faculty. It is not within the gift of the dental faculty. It can be obtained only as the result of post-graduate attendance upon medical lectures and book study. He must then prepare a thesis, setting forth the result of individual clinical work in medical subjects, and successfully pass examinations in full medical anatomy, bacteriology, pharmacology, and general pathology. Such studies are entirely theoretical, there being for the dental student no opportunity for medical hospital training. In other words, the student has learned more theory out of books, but nothing related to his life work. For example, a candidate for the degree of Doctor of Dental Surgery was recently given the subject: "The Effect of a Milk Diet upon the Feces." It is a happy thought that if old age, improvidence, failing health, or another war should compel one to live upon a milk diet, the Doctor of Dental Surgery to whom he applies for a filling will be thoroughly well informed as to the effect of that diet upon the feces, whether or not he knows how to fill the tooth.

The Number of Students Graduated

So severe is the preliminary training that the Dental College of the University of Zurich has received, as I remember, an average of not more than fifteen

students for each half-year, the half-year being the basis of our dental educational system, and not the full year, as in America. Of this number, perhaps, one in seven fails to receive the degree of Dentist from the University and goes elsewhere to complete his studies. Perhaps not more than five for each half-year go on to receive the degree of Doctor of Dental Surgery. My memory is that the University of Zurich has graduated about twenty-five dentists for each of the last ten years and that not more than twenty-five or thirty are graduated from all the other dental colleges in Switzerland, making, in all, from fifty to sixty dentists each year, of whom perhaps twenty finally receive the degree of Doctor of Dental Surgery.

The Upheaval From Below.

Now I want to invite your attention to some unexpected results of this limited production of dentists and the probability, in the immediate future, of some important effects therefrom.

Switzerland has a population of perhaps three and a half million persons. I think there are not more than four hundred graduate dentists to serve the needs of this population, that is, one dentist to about 9,000 persons. There are also some dental mechanics licensed to practice in the mouth as the result of legislation of twenty years ago, but these are slowly dying and the number can not be increased.

As the result of the long period of preliminary and college preparation, the young men who receive the degree of Dentist or Doctor of Dental Surgery naturally seek those locations and that clientele where they can be best remunerated for their services. Those classes of the community who are financially well-to-do are well provided with dentists, but the fees charged to this class are such as the middle and poorer class can not pay. The disfigurement and suffering which result from the lack of dental services and the increased knowledge of the improved appearance, comfort and health which result from even reasonably good dental service have led the middle and poorer classes to unite in a demand for dental services for themselves and their children, which is voiced with such force and directness as is likely to greatly influence the history of dental education in Switzerland in the future. This demand by these classes is reinforced by statements from representative members of the medical profession to the effect that dentistry is merely a trade and that the making of crowns, bridges and plates, as well as the filling of teeth, requires no scientific education. I feel that such statements could have been born only as the result of ignorance of the principles of dentistry, a failure to appreciate its possibilities, and more or less jealousy of the development which, in spite of all difficulties, it has attained.

There is no hope that the number of dentists required to satisfy the population could be provided by the form of dental education which is now legal, or that dentists, educated by such a system, would be any better able to serve the middle and poorer classes than are the dentists whom the system now develops. The socialistic party is very strong in Zurich. Supported by the statements from the medical profession, it has been able to secure a referendum vote by the population on a proposition which establishes a new system of dental education and, if successfully carried out, may spell the death knell of the present system. This legislation proposes that any young man possessed of what you call in America a "common school education" may enter a dental office or laboratory as an unpaid assistant for three years, serve four years as a paid assistant, take a course of perhaps two years of theoretical and practical dental instruction in a dental college to be erected for the purpose, after which he will be

licensed to extract teeth, fill teeth, and make crowns, bridges and plates. If I remember correctly, about the only things that he will not be permitted to do will be to induce anesthesia, to treat putrescent roots or alveolar abscesses, broken jaws, pyorrhoea and cleft palates. A letter received from Germany this week tells of the establishment of such a special dental college there.

THE PORTENT OF THIS LEGISLATION.

The threat of this legislation to the future of dental education in the Canton of Zurich and later in all Switzerland and perhaps in the surrounding countries is much greater than might appear at the first glance. If the proposed law is passed, it will be possible for one who selects this vocation in life to go immediately from what you call the grammar school into the dental laboratory or office. He will thus reach the dental office eight years earlier than the young man who is to take the High School and collegiate training.

A factor in which you are bound to be interested enters into the problem. The ability to develop the talent essential to a high order of manual skill is dependent upon the exercise of those talents very early in life, preferably beginning in childhood and continuing thru the period of youth. The ingenuity for which your nation is proverbial is merely the continuation in adult life of the powers developed in the children of a new or young country by the making or improving of the toys for their play. After the age of twenty-two, it is no longer possible for the young man, who has not developed his skill by nearly continuous play or work, to ever develop it to a degree which will enable him to compete with those who began in youth. Therefore, these young men who, under the proposed law, enter a dental office or laboratory at not later than sixteen years of age and devote themselves to the development of manual skill, establish a handicap over the college-trained man, which it is very unlikely that he will ever be able to remove. This may seem merely theoretical and, therefore, be questionable. But it is borne out in practice. When our most carefully trained graduates go as assistants to practitioners sorely in need of their services, they are incapable of performing the simplest operations in a suitable manner. They require the entire morning to make two or perhaps three simple cement or amalgam fillings. Nor have they the ready adaptability of the boy in your country who sets out to make a bow with which to shoot arrows, but, chancing to spoil it by poor work, changes it to a whipstock, attaches a string, and plays a game of "horse."

The practical effect of this is shown by the fact that some of the mechanics who were granted licenses to practice under the legislation of twenty years ago are among the most skillful of practitioners, are more sought after than many of the college graduates, and are in receipt of much higher fees for services than many college graduates are able to command. If I remember correctly, the legislation which enabled these men to enter practice was repealed by concerted action of graduate members of the profession, probably as a measure of self-protection against the superior manual skill of those whom they called mechanics.

If the proposed legislation is established and has the results which might well be expected from it, it is very doubtful whether any future concerted action by graduate dentists could secure its repeal, since that would require a referendum vote by the population.

THE POSITION OF SWISS DENTISTS.

How happy, then, will be the position of the Doctor of Dental Surgery in Switzerland who, after eight to ten years of academic and college preparation, will enjoy the exclusive right of treating

putrescent roots, diseased gums, cleft palates, and of setting broken jaws and making apical resections, but who may be unable to perform the more usual operations of dentistry as well as the competitor whom he scornes. Where is his financial return to come from if the graduate dental mechanic is to perform all of the other operations better or perform them with equal skill and at lower fees?

As I have thought these things over, I have not been so unhappy as I might otherwise, because I remember that in Switzerland there are many families in very comfortable financial circumstances. In these families are many attractive daughters. Doubtless many such will be glad to share the family wealth with one who enjoys the social position of a Doctor of Dental Surgery. In other words, if the dentist's preliminary education has disqualified him as an operator, it has qualified him in an intellectual and social way. If he can not earn money, he must marry it.

In Austria and Italy.

In Austria and Italy conditions seem to be even worse. The young men must there graduate in general medicine before they can specialize in dentistry. They take up dentistry as the oculist or nerve specialist takes up his branch. After so long a preparation they are ashamed to call themselves dentists, so they call themselves stomatologists. Before these men have reached the condition where they can practice dentistry, the age for the development of manual skill has long past, and in these countries the general public prefers to have its teeth treated by dental mechanics.

Post-Graduate Education.

You are developing in this country a system of education which seems to me to be full of promise. I refer to the post-graduate education, by which dentists who have been in practice are enabled to acquire information concerning the special lines in which they are interested. I understand that your colleges are just beginning the conduct of this work. It seems to me to fill a great need.

We have nothing of this sort in Switzerland. Our practitioners, once launched, are left to their own devices. At just the time in life when those members of the profession who are fortunate enough to combine the qualities of headwork and handwork begin to realize their shortcomings and what might be their possibilities under other conditions, and need for the future new zeal and courage, they are left helpless.

With us, this sense of need has been undefined and inarticulate. It has rumbled in the back of certain minds as a feeling of dissatisfaction with present achievements and sometimes with the profession of dentistry itself. The very system of professional education which I have described to you as in full power at Zurich has tended to prevent the recognition of this need or the finding of an answer. I have shown you that the emphasis is there laid on botany, zoology, chemistry, physics, embryology, histology, anatomy and physiology. You have seen that nine years of study above the grammar schools are required for the degree of Doctor of Dental Surgery; that these include all the formative years of the young man's life; that seven of them are spent exclusively in studying books, and that only after the formative years have mostly passed, are two years given to teaching dentists to do things with their hands. Seven years of books and two years of instruments to train a man to use instruments the rest of his life! You can see that our system of professional education flees from the practical side of life as the devil is said to flee from holy water.

But a change is coming in Europe, at least in that line in which I am most particularly interested, the making of

artificial dentures. Because of my special interest, I have been at some pains to keep myself posted as to the progress of this change.

Two years ago, some young men from Europe who combined the gifts of handwork and headwork, and whose respect for the established order of things had been somewhat broken down by the war, in which they had served as officers and in which they were compelled to do things in the most direct manner, came to this country, mastered advanced methods of taking correctible impressions and bites, and articulating artificial dentures, and returned to Europe to spread the new gospel before their associates. They were unable to obtain recognition upon the programs of the regularly constituted dental societies, so they secured separate rooms in what you would call "the exhibit space," prepared to make practical dentures for edentulous patients, and advertised that each step would be performed in the view of the audience and that results heretofore unknown in Europe might be expected. Their rooms were thronged from the first session, the same audience being always present and following each step of construction with the most minute attention.

At the first great meeting of this sort, when the dentures were completed, the demonstrator placed the upper in the patient's mouth and paused to make some explanation before inserting the lower. The interest of the audience was too great to permit the delay. They drowned the explanation with shouts of "Put in the lower." And when the lower was seen to be stable in all positions of the mouth and to have what you call "suction," the enthusiasm reached the limits of conservative expression.

A Welcome in Other European Countries.

From the English-speaking countries, this work was carried to Denmark, Norway and Sweden. Everywhere it was met at first with silence and suspended judgment. Everywhere, upon demonstration of its merit and power to improve practical service, there were accorded it the same glad welcome and unrestrained enthusiasm. Later, the work was taken to France, and I understand that plans are now being laid for its development in that country next year upon a scale greater than anything which has been done in America.

While I am not so familiar with the development of post-graduate education in other lines, I understand that in America denture making is only one of many lines in which this work is either in existence or will come into existence. It will reach us in Europe and its effect will be very great.

The Effect Upon Under-graduate Education.

I have spoken of the dissatisfaction of the general public in Switzerland, Austria and Italy with the results of the system of dental education now in vogue. I have shown you how the people are beginning to beat, with strong hands, at the doors of that system, and that, unless the system is altered to meet their needs, it is not at all impossible that they may demolish it. This post-graduate education is a force within the profession which is perhaps equally great. If the legislation now sought in Zurich is enacted, so that the road to dental practice is open as the result of seven years of laboratory training and a course in a special dental college, and great centers of post-graduate instruction spring up in Europe, the present system of dental education will be left in a condition described by one of your famous presidents as that of "innocuous desuetude." There are still monks in Europe who have withdrawn from the turmoil of the world and who in the seclusion and quiet of monasteries hidden in almost inaccessible places tell their beads and pray. If influences

which can be plainly foreseen become operative in our profession, those interested in the present system of professional dental education in Switzerland might as well sell their buildings, locate in these monasteries, and employ the monks as teachers.

These forces may not become operative this year or next, but no student of the times can fail to observe that the social unrest is bursting thru all of the levels of caste, social, professional, financial, or political, and bringing the heretofore submerged man to the top. He is looking about him with new eyes, is asking why institutions which were professedly created to serve him and for which he has paid taxes do not serve him more effectively. He is developing a new spirit of concerted action and power with his fellows; is asking that the necessary changes be made promptly, but peaceably, and is stating plainly that if they are not so made, he will take matters into his own hands and make them by force.

In making this statement, I do not refer to the Bolsheviki or the Communists or any other class of people who prefer violence to peace. I refer to the sober-minded, law-abiding citizens such as those who composed your own Revolutionary armies. In these men the experiences of the war have sharpened the sense of failure with their institutions, and they propose to see whether a change can not be made. In the face of refusal, they are ready for experiments.

The Portents for America.

You here have a wonderful country. Each time I return to it, I am more impressed with its extent, its wealth, its power and its possibilities. In the automobile ride from New York I passed, in the course of a few hours, over a greater distance than the longest diameter of Switzerland. I saw many cities and in them factories representing millions of investment, employing thousands of operatives. And I know that in comparison with the extent of your country which I have not yet visited, this distance is short and the people whom I have seen are few.

When I think of these things and of the immeasurable opportunities they present, I wonder what the future of this country will be. For other nations have been great, powerful and rich. Babylon, Greece, Rome and Venice exercised world power for periods of time compared with which the years since the Fourth of July, 1776, are only as those of an infant. It is only one hundred and forty-four years since you declared your political independence. Each of these nations I have mentioned was a world power for more than a thousand years.

Long ago, as men measure time, but only yesterday, as time must appear to the divine eye, a king of Babylon, at the height of his pride and pomp, saw a handwrite upon the wall: "Thou hast been weighed in the balance and found wanting." In what had he been found wanting? Not in wealth, not in pomp, not in power. He had been found wanting that spirit of service to his fellows which the Galilean Teacher later expressed in the command: "Thou shalt love thy neighbor as thyself."

Each of these nations has fallen utterly. The power and pride and pomp are forever gone. As one walks among the ruined temples of ancient Greece or the few pillars which are all that remain of the once great Roman Forum or gondolas along the quiet canals of Venice between palaces, from which the glory has departed, he can not but experience that feeling so well expressed by Tennyson, when he said:

"I doubt not thru the ages one increasing purpose runs
And the thoughts of men are broadened with the progress of the suns."

It seems to be written in the principle of things that only those things shall endure which are for the benefit of all the people and that those things which are for the benefit of the few and the submerging of the many shall pass away. Sometimes the world enjoys a long period of peace. Knowledge increases, and wealth, power, pride and pomp multiply. Classes are built up. And then, just when all seems well, some vandal hand knocks at the structure of things as the Persians knocked at Nebuchadnezzar's gate, and either peaceably or forcibly things are set upon a new basis.

In the long history of time and in comparison with the mighty questions now pressing for solution, our structure of dental education is but a tiny thing. But we are tiny, also, and the building of this structure is the bit which is given us to do. If we build it into a scheme for developing a high social order, if we surround it with barriers higher than the interests of the whole community demand, so that only a favored few get in, while many who deserve admission are kept out; if it does not well serve those for whom and by whose legal permissions we conduct it and perhaps by whose tax payments we maintain it, we shall be able to accomplish our ends for a time. But, if there is in us no understanding of the fact that the law of service includes justice and certain forms of equality for all men and we give no promise of bringing that justice and equality into effect, forceful hands will be laid upon us in that very hour when we feel most secure. We shall either be relegated to the position of the monastery and the monk or we and our structure of education will go down in ruins together.

As a teacher from one of the countries where social unrest is much greater than you could understand without living there and where such forces are boiling just below the surface that it is by no means sure that the worst has yet come to pass or even been prophesied, I can bring you no better message than that you should use the utmost care and thought to avoid the development of any system of dental education which will separate the interests of the men whom you train from the interests, feelings, thoughts or actions of the public whom they serve. And let me caution you, also, to be very careful about putting hindrances in the way of training enough dentists to satisfy the reasonable demands of the population.

You in America have a wonderful opportunity. We on the other side of the water look to you to develop the system of dental education so wisely that it will have the glad support of the entire population and that in days of trouble it can not be shaken. And when our light is dim and our feet walk in troubled ways, we shall gladly turn our eyes to this side where the torch of leading and of knowledge is held high and burns clear, because your system of education is, in the words of your great emancipator, "of the people, by the people, and for the people."

THE PRESIDENT'S ANNUAL ADDRESS—WISCONSIN.

By C. W. HALL, D. D. S., Milwaukee, Wis.

(Read before the Wisconsin State Dental Society on July 13, 1920, at Its 50th Annual Session held in Milwaukee, Wis.)

IN PRESENTING the President's annual address, your President finds himself in the midst of a whirlpool of thought that tends to swamp him in the gulf of hopeless bewilderment.

We have arrived at the one-half century mark of our Society's existence. We are looking forward into the boundless future. We can mark the present and we can note the past, but can anyone with reason, after measuring the progress of our profession during the past fifty years, draw a mental picture of its achievements thru the ages to come?

Then, let us pause for a few moments and turn our thoughts to some of the people and things of the past, and some of the occurrences and needs of the present, and leave time and necessity to shape for us the history of the future, for after all, the future remains but a prediction and our success and failures are only measurable by the events and experiences of the past.

The Wisconsin State Dental Society was founded in the month of September, 1870. The first meeting was called to order in the office of Dr. D. W. Perkins, on Wisconsin St., Milwaukee. The records are not clear as to just what sentiment lead up to the calling of this first meeting, but the records do show that there were fourteen members present and nineteen names constituted those who signed the charter. It is to these men that we owe our gratitude for founding an institution that was destined to be the great guiding factor among the profession of our state.

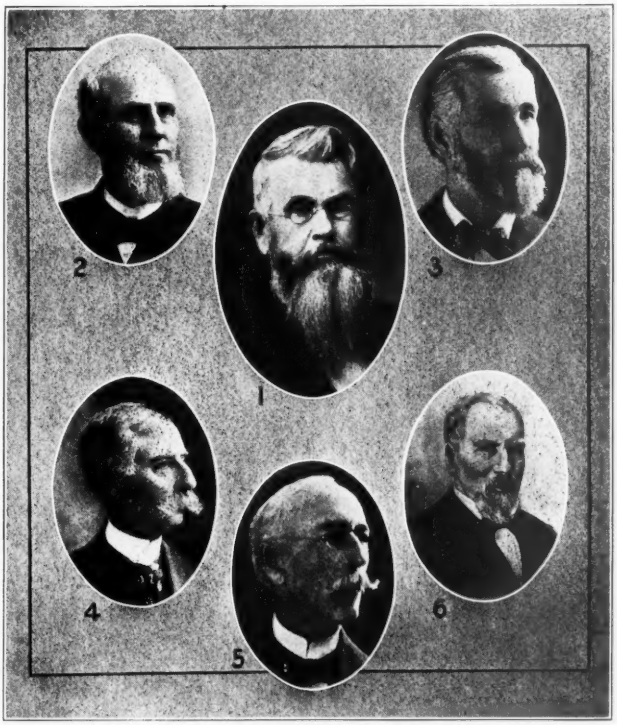
The names of those who signed the charter are as follows: J. C. Lukes, Racine; E. Churchill, Columbus; Geo. H. Sherwood, Burlington; C. W. Barnes, Fond du Lac; Edgar Palmer, La Crosse; N. H. Drew, Prairie du Sac; Arthur Holbrook, Waukesha; Myron P. Goodwin, Horicon; D. W. Perkins, Milwaukee; Wm. D. Brown, Milwaukee; E. W. Foster, Milwaukee; Chas. C. Chittenden, Madison; L. C. Stewart, Waupun; S. L. Judd, Beloit; N. J. Moody, Madison; E. N. Clark, Beloit; M. B. Johnson, Janesville; Joseph Green, Whitewater; Albert Solliday, Watertown.

It is a noteworthy fact that even at the founding of our Society, those who were interested in the progress of dentistry came from all parts of our state.

Of those who attended that first meeting there is but one living at the present time, Dr. Edgar Palmer, of Los Angeles, Calif., who still reports himself to be as hale and hearty as a boy of 80 years could reasonably expect to be. In a recent letter to Dr. Colleran, of La Crosse, he says in part: "It is pleasant in the sunset of one's life, to feel conscious of having done my part towards installing higher ideals and better equipment into the hearts and minds of so many young men and giving to my profession the best there was in me of crucial mould." This short quotation has in it a world of meaning. It brings us face to face with that spirit of imparting to others those things and ideas that marked the life-work of that group of wonderful men who founded our Association. It is not written in the

history of our profession that all men of that day were equally generous, but rather the minority was endowed with the true vision of what dentistry was to mean to the world.

It would be unbecoming of me and I feel that I would be open to censure by the members of your society, if I were not mindful at this time of the many benefits that we are enabled to enjoy thru the pioneer work done by that group of men who are permitted today to sit in silent review (thru the grace of Almighty God) while we bask in the full sunlight of their achievements. Many of us may look with pride and with pleasure to the knowledge we gain and the personal friendships we have had with those early founders of our Association.



ORIGINAL OFFICERS 1870

1. D. W. Perkins, Milwaukee.....President
2. E. N. Clark, Beloit.....1st Vice President
3. A. Holbrook, Waukesha.....2nd Vice President
4. C. C. Chittenden, Madison.....Recording Secretary
5. E. Palmer, LaCrosse.....Corresponding Secretary
6. J. C. Lukes, Racine.....Treasurer

It is not your President's intention to attempt a recital of the past events of our Society, nor go into the details of the activities or lives of those who

have been prominent in its affairs. It would be very interesting, however, if some one would compile a history covering these things, but time and space will not allow for it at this time.

Dentistry, as a profession, had a very humble beginning, but being borne out of necessity, it was bound to flourish. It is a peculiar combination of Art and Science and admits of such a range of thought that it at once becomes the mecca of one who wishes to specialize. Not even can the general practitioner of medicine boast of a calling more vital to the welfare of mankind, or the sculptor, of an art more rare than that which is within the field of the dental practitioner.

The past fifty years have brought to us much, for we may almost count the development of our profession within this time. To the men who have heard and answered the call; to the men who have seen the vision and gone out as pioneers to develop their ideas we are indebted. It was the man who found the art in dentistry who grew more and more steadfast and the man who saw and recognized the ravages of dental disease who knew and realized that fundamental knowledge alone could accomplish the desired ends.

It has taken us fifty years to come to the full realization that no dentist is fully equipped without all obtainable knowledge of the healing art. Then, can it not be said that we are rapidly reaching that point where a degree in dentistry must be preceded by a fundamental knowledge equal to that required for the general practitioner of medicine? The college that first makes such a demand of its graduates will indeed have the true courage of its convictions and place high ideals ahead of all other motives. It is a step that must soon come. It is the step that will place dentistry in the position it must occupy in order that it may receive its proper recognition and give to those whom we serve the proper confidence and esteem.

You will probably bear in mind that at the time of the founding of your Society there were no rules or laws governing the practice of dentistry. There was not a word covering the subject of practice of dentistry written in the Statute Books of our state. Men were allowed to practice dentistry at will, with or without knowledge or technical training.

Twenty-five years ago we were beginning to realize that our profession must deal not only with the restoration and repair of the dental organs but we must know more about the cause of lesions of the teeth and adjacent tissues. Today we are dealing with the problem of life and death. Surely, we must come prepared and surely we must be the masters in our own household.

There is much that I might say of the growth of our Society and of the steady progress it has made during these fifty years. However, the knowledge you already have of the progress of your Society bears testimony in itself to the work that it has accomplished. It is a monument to those who have been its sponsors.

Then let us be ever mindful of our inheritance left to us by those who have blazed for us the rugged trail and not falter in our duty for the betterment of mankind.

There are matters of more or less importance at the present day that have come within our observations during the past year that might be of interest and I will leave them with you for your consideration, if you so desire.

In the past, your President has had the privilege and legal right to name the delegates to the National Dental Association annually, the number of delegates named being in accordance with the Constitution and By-Laws of the National Dental Association. The alternate delegates have been appointed in the same manner. It is a noteworthy fact that they are of little use to you unless they have had some experience in the affairs of the National Body. I

believe it would be well to change your manner of choosing these delegates so that the appointment of each would cover a term of years. This Society has at the present time approximately 950 members and should be well represented in the National Organization.

Again since the re-organization of our State Society under the Component plan there has been considerable confusion and much lack of co-ordination between the State and Component Societies. There should be a closer relationship between these bodies. Much valuable time is lost in correspondence due to lax methods and a lack of systemization.

Our membership should be built up and there should be a well organized plan of campaign for that purpose.

We should publish and maintain a bulletin published quarterly at least. This bulletin is now possible and made practical by our increased membership during the past few years.

OFFICERS 1920.

1. C. W. Hall, Milwaukee.....President
2. J. V. Miller, Manitowoc.....1st Vice President
3. W. I. Macfarlane, Tomahawk.....2nd Vice President
4. W. F. Faust, Milwaukee.....Secretary
5. Adolph Gropper, Milwaukee.....Treasurer
6. Roy S. Hopkinson, Milwaukee.....Librarian

PRESIDENTS.

1. D. W. Perkins
   Milwaukee
   1870-1871
2. Edgar Palmer
   LaCrosse
   1871-1872
3. Arthur Holbrook
   Milwaukee
   1872-1873
4. C. C. Chittenden
   Madison
   1873-1874
   1894-1895
5. C. W. Barnes
   Fond du Lac
   1874-1875
6. R. S. Wells
   Sparta
   1875-1876
7. S. M. Gilman
   Beaver Dam
   1876-1877
   1877-1878
8. J. M. Barker
   Elkhorn
   1878-1879
9. Wm. Decker
   Oshkosh
   1879-1880
10. M. T. Moore
    La Crosse
    1880-1881
11. G. H. McCausey
    Janesville
    1881-1882
12. L. C. Stewart
    Waupun
    1882-1883
13. J. S. Reynolds
    Monroe
    1883-1884
14. B. G. Maercklein
    Milwaukee
    1884-1885
15. J. S. Perkins
    Milwaukee
    1885-1886

PRESIDENTS.

16. W. H. Chilson
Appleton
1886-1887

17. W. F. Lewis
Milwaukee
1887-1888

18. W. H. Carson
Milwaukee
1888-1889

19. E. F. Long
Black River Falls
1889-1890

20. C. P. Southwell
Milwaukee
1890-1891

21. E. C. French
Eau Claire
1891-1892

22. W. C. Wendel
Milwaukee
1892-1893
1893-1894

23. Claude A. Southwell
Milwaukee
1895-1896

24. T. B. Fletcher
Portage
1896-1897

25. R. G. Richter
Milwaukee
1897-1898

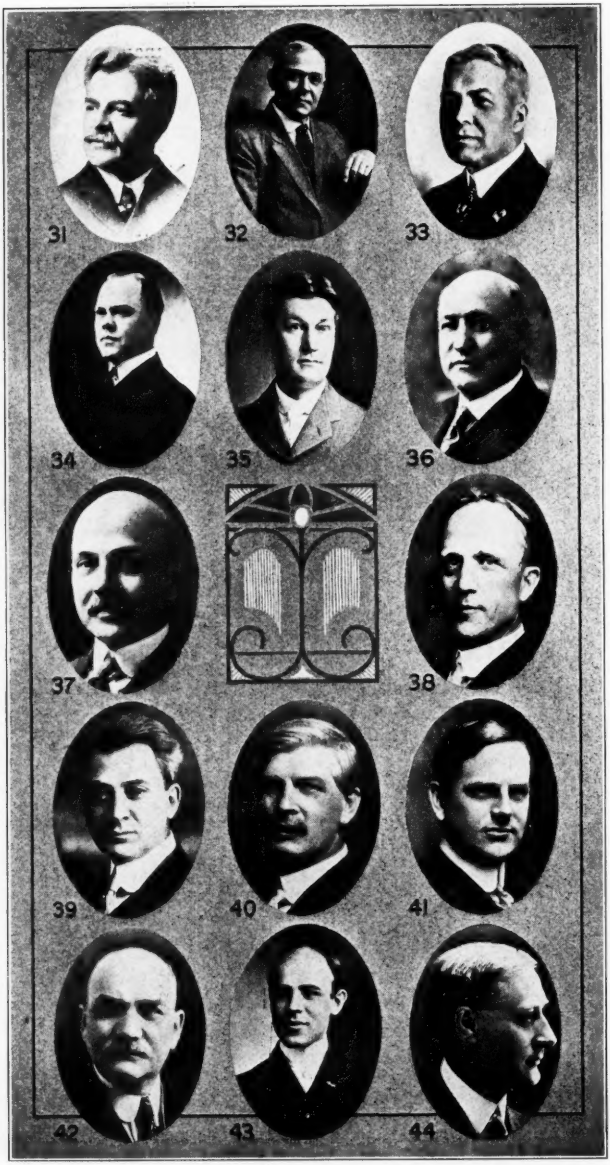
26. C. W. Bennett
Monroe
1898-1899

27. J. H. Reed
Lancaster
1899-1900

28. E. A. Gatterdam
La Crosse
1900-1901
1901-1902

29. T. M. Welch
Waupun
1902-1903

30. A. G. Fee
Superior
1903-1904



PRESIDENTS.

31. H. T. Sackett
Fond du Lac
1904-1905

32. F. G. Van Stratum
Hurley
1905-1906

33. W. H. Cudworth
Milwaukee
1906-1907
1907-1908

34. W. H. Mueller
Madison
1908-1909

35. H. N. Jackson
Milwaukee
1909-1910

36. J. L. Malone
Superior
1910-1911

37. H. L. Banzhaf
Milwaukee
1911-1912

38. R. J. Wenker
Milwaukee
1912-1913

39. T. A. Hardgrove
Fond du Lac
1913-1914

40. Wm. Hopkinson
Milwaukee
1914-1915

41. O. G. Krause
Milwaukee
1915-1916

42. L. A. Meyer
Oconomowoc
1916-1917

43. E. A. Geilfuss
Milwaukee
1917-1918
1918-1919

44. C. W. Hall
Milwaukee
1919-1920

Your President believes that your Society should maintain a fixed place for its official records to be kept and its official mail to be received. The establishment of a home office of the Society, where all members or persons could address correspondence to the Secretary. The Secretary's office could be secured and maintained by this Society and it would add greatly to the convenience of all its members. We do not mean by this that a great burden should be placed on this Society that would be a drain to our treasury, but we suggest that it might be possible to secure such mutual arrangements with the Milwaukee County Component Society that a permanent office of our Secretary could be made possible.

While we must be fair and free from any taint of unwarranted agression or any move that might brand us as attempting to be unfair in our practices, there is a growing sentiment that an alliance might be established between the dentists of the upper peninsula of Michigan and our State Society whereby they might become members of our Society. There are many reasons why this arrangement would be practical.

You have all been aware of the efforts that have been put forth during the past year to secure the 1921 meeting of the National Dental Association for our State. In this effort a great many of you members have been deeply interested. Your delegates to the National Convention at New Orleans last October were practically assured that the 1921 meeting of that body would come to Milwaukee.

Your President believes in the integrity and the progressive spirit of the dentists of our state; he believes that it would be well for your Society at this session to pass such resolutions that would convey to the National Body the assurance that we are ready with all our energies and our available resources to make that meeting the greatest that the National Society has ever held.

The last subject of which I wish to speak to you is one that affects me the most, the one that has given to me many of the happiest hours of my life, the satisfaction of being the President of a united Society, the officers, committees and members all standing ready to do their part to make the last year a pleasant and progressive one. It has been the pleasure of your President to meet with one-half of the Component Societies at one of their meetings during the year; to have held one meeting where fifteen out of nineteen of the Component Societies sent a representative that we might better work out the plans for concerted work for this year's program; to have met everywhere with cooperation and encouragement. It is due you that I may say that there has not been one case where your President has asked the assistance of an officer or a member that it has not been granted. In the local Component Societies, splendid gains in membership have been made and great effort has been put forth to furnish material for the success of this meeting. Clinicians have worked diligently for hours, preparing their exhibits. Committees have worked without stint of time and officers have made no end of sacrifice for the success of the year. With this behind me, let me extend to you, one and all, my heartfelt thanks for your kindness and help. Let me say to you that your Society cannot help but flourish with your spirit and your support behind it and now our 50th Anniversary meeting is a thing of the present; it is ours to enjoy; we are happy in the memory of those who have made it possible for us and we are happy in the thought that we are a part of this meeting that you have planned so well. Once more may I extend my thanks and my gratitude for the honor that you have conferred upon me and for your kind assistance and support.

FREQUENCE OF THE SUPERNUMERARY CUSPS UPON THE TEMPORARY MOLARS.

By ANGELO CHIAVARO, M. D., D. D. S.
Professor of Dentistry in the Royal University of Rome, Rome, Italy.

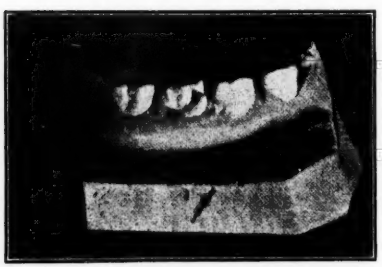
FOR us dentists the deep knowledge of morphology of the crown of the teeth is of fundamental importance.

In the text-books of dental anatomy, which are generally studied and consulted, after a particular description of each permanent tooth, that of the temporary teeth generally is very short, stating only that the six anterior teeth (incisors and canines) and the second molars have respectively their crowns of the similar form as that of the previously described permanent anterior teeth and first molars. There is in those books the particular description of the first temporary molars, which are different from any permanent tooth and there are described the fundamental differences between permanent and temporary teeth. Some authors of general treatises of dentistry describe as anomaly of the crowns of the teeth the gemination of the anterior teeth (fusion of the crowns of two near anterior teeth).

* * *

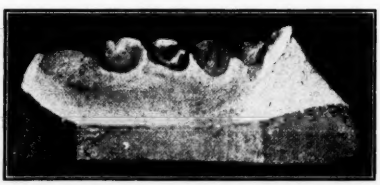
For some statistical studies that I made in 1912-13, I made researches upon temporary teeth and examining the mouth of many hundreds of children between three and six years of age, my attention was drawn also to the anatomical form of the crowns of molars.

Figure 1.



Vestibular surface of the upper left temporary teeth. Upon the vestibular side of the first molar there is a **supernumerary cusp.** The photograph is slightly enlarged.

Figure 2.

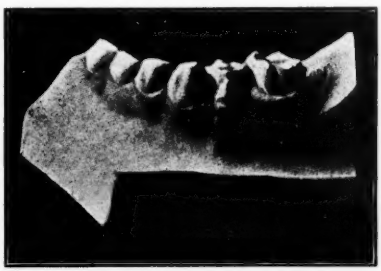


Similar case as Figure 1.

Upon the surface of the crown of the first upper molar I observed sometimes on the region of the protuberance described by some authors upon the vestibular surface toward the mesial corner a *true and real supernumerary cusp.* This cusp I had never observed before, and I do not remember it being described by the authors with whom I studied dental anatomy. In my inspection I observed that was sometimes present upon the vestibular surface of only the upper first molar of one side (Figures 1 and 2) and was not on the

homologous tooth of the other side; sometimes it was present in both the first upper molars. Sometimes I observed its presence in the same place on

Figure 3.



Vestibular side of lower left temporary teeth. Upon the vestibular surface of the first molar there is a **supernumerary cusp.** The photograph is slightly enlarged.

the lower first molar of one side (Figure 3); sometimes upon both the lower molars. I never found contemporaneously the presence of this supernumerary cusp upon all four the upper and lower first molars.

Figure 4.

The lingual side of upper left temporary teeth. **Fifth cusp** upon the lingual surface of the second molar. Photograph slightly enlarged. In this case the fifth cusp is much developed and is also much developed the mesio-lingual cusp of the same tooth.

Another observation which I could make in my inspection was the great frequence of the fifth cusp upon the lingual surface towards the mesial corner of the second upper temporary molar (Figures 4 and 5).

The writers of dental anatomy, as I wrote, do not generally describe the crown of this temporary tooth; they only write that it resembles in its form the crown of the first upper permanent molar, but do not deny nor affirm that occasionally one can find also a fifth cusp upon the lingual surface towards the mesial corners upon the second upper temporary molar.

To be sure that some authors of treatises of dental anatomy studied by

Figure 5.

Similar case as Figure 4, but the fifth cusp is less developed.

me, had or not noticed also the presence of the supernumerary cusp upon the first upper and lower temporary molars and the fifth lingual cusp upon the second upper temporary molar, I wrote them a letter, to which two of them kindly answered as follows:

Dr. G. V. Black (Chicago, March 2, 1914).

"Speaking from my memory, I should say that the expression in my book to which you refer must refer to the most general form of the tooth in question, as compared with the first permanent molar, and allows for certain variations in form; most of which, if not all, we can find duplicated in the first molar. I have seen the mesio-lingual cusp of

which you speak, tho they do not occur so often as they occur on the permanent molar. I thank you for your letter and the questions it propounds. Each question of this kind has a value in the after considerations of any changes to be made in the book."

Dr. I. E. Constant (London, March 3, 1914).

"By a curious coincidence it is a point which I have been investigating lately, and I have been inspecting large numbers of school children and have therefore had exceptional opportunities for observation.

"I have found the appearances you describe both with regard to the first and second upper temporary molars.

"Except yourself I do not know anybody who has described them."

Having had occasion to consult the "comparative anatomy of the dental system" by Rousseau, published in second edition 1839, I found in this book that the fifth lingual cusp of the second upper temporary molar is not described in the book, but in table 2, Figure E-5; the fifth cusp is designed on the lingual surface of a second upper temporary molar. In the same table 2, Figure C-4-d is designed a first upper temporary molar on its lingual surface and altho there is not designed any tuberosity, in the position where it should have been it is marked with letted d; on page 265, in the explanation of the figures, the author writes: *d, tubérosité qui caractêrise la couronne de cette dent.* But the characteristic tuberosity would be, according to the figure designed in a book, upon the lingual surface instead of the vestibular one; in the book, as I have said, these anatomical particularities are not described.

Some Austrian and German authors, which I consulted after having made my observations, describe and illustrate with figures a *protuberance or tuberosity* upon the vestibular surface of the mesial cusp of the first temporary molars, but not a *true and real cusp* like that observed by me; but they notice the frequence of the fifth cusp upon the lingual surface of the second upper temporary molar.

In his "Comparative Anatomy of the Dental System," published in 1911, Paul De Terra, on page 382, briefly describing the first temporary molar writes that upon its vestibular face there is sometimes an *hemispheric protuberance* (Halbkugelige Vorsprung) represented in Figure 49 of the book; it can be found also on the first lower temporary molars. This protuberance was called by Zuckerkandl *tuberculum molare* and by Aeby *lateral protuberance.*

Baume (1890) and Mühlreiter (1891) write that often the presence of such *protuberance* has been noticed by them.

At the place of the *almost round protuberance* described by those authors and by myself frequently noticed, I have found a *true cusp,* with its point well developed and sometimes slender, upon the vestibular surface towards the mesial corner of the crown of the first temporary molar, coming out with its base from the region of the cervical line; in some cases it looked like a small peg-tooth fused with the hard tissues of the vestibular face of the molar, as it is seen in the photographs represented in Figures 1 and 2.

The *fifth mesio-lingual cusp* of the second upper temporary molar is very frequently found. It has been noticed also by the mentioned Austrian and German authors. Zuckerkandl has found it in more than 90 % of cases, and by him this is one of the peculiar differences between this tooth and the

first upper permanent molar, on which he has noticed the presence of the *fifth cusp* in only 26 % of cases. But, Zuckerkandl includes in his calculations all the cases in which the *fifth cusp* of the second upper temporary molar is hardly represented by an *hemispheric protuberance.* He says in fact that on 110 observations made upon the temporary teeth he found that the *fifth cusp* of the second upper temporary molar was *well developed* in 26 cases, *fairly well* or *slightly developed in* 69 cases and *absent* in 15 cases.

From the researches made by me in the mouths of 1000 children upon the *vestibular cusp* of the first temporary molar and upon the *fifth cusp* of the second upper temporary molar, *taking notice only of the well developed cusps.* I have drawn the following statistics, which I think are the first so completely published:

STATISTICS ON THE FREQUENCE OF A **SUPERNUMERARY CUSP** UPON THE VESTIBULAR FACE TOWARDS THE MESIAL CORNER OF THE CROWN OF THE FIRST TEMPORARY MOLAR.

Upon the first upper right only	21	in 1000
Upon the first upper left only	15	" "
On both upper contemporaneously	32	" "
	68	
Upon the first lower right only	9	" "
Upon the first lower left only	1	" "
Upon both lower contemporaneously	3	" "
	13	
Total	81	

STATISTICS ON THE FREQUENCE OF THE **SUPERNUMERARY FIFTH CUSP** UPON THE LINGUAL SURFACE TOWARDS THE MESIAL CORNER OF THE SECOND UPPER TEMPORARY MOLAR.

Upon the right only	21	in 1000
Upon the left only	18	" "
Upon both contemporaneously	376	" "
Total	415	" "

By the results shown by my statistics the *supernumerary cusp* of the first temporary molar is found more frequently upon the first upper molar than upon the lower, and more often in both the first upper molars contemporaneously than upon the molar of one side only.

I have not had occasion to observe this supernumerary cusp well developed upon the four first molars contemporaneously; only in one case I saw it upon both the upper and on the first lower right molar; upon the left lower there was only one protuberance. But in a great many cases of which I did not take note in my statistics, because I *noticed only the cusps well developed,* I saw also upon the four first molars contemporaneously the presence of an almost round tuberculum situated at the same place which occupies the fifth cusp when present.

As a principal characteristic of the first lower temporary molar I have been able to confirm that its mesio-lingual cusp is generally the most developed and has the apex very prominent and pointed; I have found it so even in children of six years of age, while the other cusps of the same tooth were rounded by the normal abrasion of mastication.

About the fifth cusp of the second upper temporary molar my percentage of 41 seems greatly inferior to the percentage of more than 90 given by Zuckerkandl, but really it is the contrary, because, while this author found the fifth cusp well developed in 26 cases out of 110, that is in 22 per cent of the cases, I have detected it well developed in 415 cases out of 1000, that is in about 41 per cent.

The fifth cusp is found more frequently in both the second molars contemporaneously than in only one of them.

In my observations, I have found a

difference of the first upper and lower temporary molars and of the second upper temporary molar, the second lower temporary molar always keeps its typical form; it has always five cusps; three vestibular and two lingual.

All that I have noticed about the supernumerary cusps of the temporary molars and on their frequence makes me think that there are two questions to solve:

1. Why are they not always present?
2. What is and what has been their function?

The human teeth seem to be in a way of reduction, especially in the more civilized races, in which it is well proved that the teeth have a tendency to a reduction in their number. In fact in the lowest human races the presence of the fourth molar is sometimes noticed (Thompson) and the third molar is *always present;* while in the civilized man the fourth molar is found only very rarely and rudimentally (Bolk) and the appearance of the third molar begins to be rare and when it appears, during its eruption it is the cause of pathological conditions, sometimes very serious.[1]

I add now that *contemporaneously to the numerical reduction of human teeth, also their form has been changing, reducing their volume.* The cusps, which today we call supernumerary and which we find so rarely, ought to have been more common in our very distant ancestors. Baume has noticed in the Chimpanzee the constant presence of a *tuberculum molare* well developed in all the four first temporary molars.[2]

As I think I have demonstrated in my work "Experimental researches upon the physiological morphology of the upper posterior small incisors of the rabbit," the *cinguli* of the upper anterior teeth of the man and the fifth cusp of the first upper permanent molar have *masticatory function and protective function of the mucosa.* I add here that I believe that the fifth cusp of the second upper temporary molar and the vestibular cusp of the first temporary molar have the same function. And if the supernumerary cusps which I have noticed are not always constant this is just due to the reduction in the size of the teeth in the most civilized human races.

In the adult man the tooth which has the greatest function is the first permanent molar analogous to the second temporary molar and of the same form as this. I have shown that the frequency of the supernumerary cusp is much more upon the second upper temporary molar than upon the four first temporary molars and I am entitled to add that in one thousand of temporary sets I never found any irregularities upon the form of the second lower temporary molar. But with the disappearance of the fifth cusp of the first upper permanent molar sometimes it is found that the first lower permanent molar instead of five cusps on rare occasions has four cusps; begins to disappear the fifth cusp which is the disto-vestibular. It would be most interesting to notice if the absence of the fifth cusp happens always or often in cases in which the third permanent molar is also absent.

Concluding, I think that I can state the following assertions:

I. *Only in* 8% *of temporary teeth is present one Supernumerary Cusp upon the vestibular surface towards the mesial corner of the crown of the first temporary molar.*

II. *Only in* 41% *of temporary teeth*

[1] In the monkey, which with us has had very distant common progenitors, there are splendid types of well developed fourth molars (Bolk).

[2] Raume, cit. da Zuckerkandl in "Handbuch der Zahnheilkunde" of J. Scheff, p. 104, Figure 58.

is present one Supernumerary Fifth Cusp upon the lingual surface towards the mesial corner of the second upper temporary molar.

III. *These two Supernumerary Cusps have masticatory function and protective function of the mucosa during* the mastication.

IV. *These new facts are to be put together with the general phenomena of reduction of the teeth of the most civilized human races; the teeth, as it was known, are in the way of reduction, not only in number, but also in volume reduction of masticatory surface, because the teeth with five cusps have a tendency to be reduced to four cusps.*

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EFFECTIVE TEACHING FROM THE DENTAL STUDENTS' STANDPOINT.

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I AM taking the liberty of limiting the very general subject assigned to me in such a way as to center attention on a question reading: "What Methods of Instruction do the Students in Certain Schools of Dentistry Consider the Most Effective?" In directing attention to this question, I am aware of the hostility existing among many teachers to attempts to measure the effectiveness of teaching by reference to the opinions of students. To some teachers, any inquiry of this character is considered as equivalent to asking students to answer such queries as: "What instructor has catered to your particular whims?" or "What instructor has given you a high mark for mediocre work?" or "What instructor has shown the most marked interest in your hobbies or your outside social interests?" Of course, answers to such questions as these are of no value in measuring effective teaching. I believe, tho, that we can agree that there is reason for basing confidence in the opinions of students when the number of such opinions is relatively large and the agreement of the students on certain important items is marked. I hope that you will agree that the data on which this paper is based is sufficiently large and the agreements of opinion are sufficiently marked to warrant confidence in the conclusions reached.

For the materials used in the preparation of this paper, I am indebted to certain faculty members and students of the following institutions: The College of Dentistry of Ohio State University; the Royal College of Dental Surgery, Toronto, Canada; the College of Dentistry of the University of Illinois, the College of Dentistry, University of Minnesota; and the Dental School of the University of Michigan. From these Institutions I was furnished 159 papers giving the answers furnished by the students of dentistry to the following questions:

First—Of your previous courses in dentistry, what course, in your opinion, was presented by the instructor in the most effective manner.

Second—To what schemes, plans, devices, or methods do you attribute the effectiveness of the instruction?

These questions were answered by 159 students of Junior or Senior standing in the 5 institutions mentioned above. In answer to the first question, reading: "Of your previous courses in dentistry, what course was, in your opinion, presented by the instructor in the most effective manner," the replies given show the following tabulated results:

Prosthesis—mentioned 34 times.

Physiology—mentioned 31 times.

Dental Anatomy — mentioned 28 times.

Operative Dentistry—mentioned 19 times.

General Histology — mentioned 15 times.

Dental Histology—mentioned 7 times.

In the way of comment on the replies to question one, I wish to state that I do not believe that this summary of answers concerning courses effectively taught has much significance or meaning. In the first place, it should be noted that answers to this question were returned by both seniors and juniors. Therefore, certain courses reported by some students had not been taken by other students. It is evident that any inquiry of this sort must, in order to have value, be submitted to groups of students having had the same number and kind of previous courses in the field of dentistry. In the second place the answers do not show sufficient agreement to warrant the conclusion that one particular course in dentistry is uniformly better taught than all other courses. However, from the summary it appears that prosthesis, physiology, and dental anatomy lead in the replies given in the 159 papers. This, however, should not lead to the conclusion that teachers of dentistry should necessarily look to instructors in these fields for the best suggestions as to effective methods of instruction.

The second question reads: "To what schemes, plans, devices, or methods do you attribute the effectiveness of the instruction?"

The answers to this question varied greatly in value but in general the replies indicated a commendable interest in the general problem of effective teaching. I might add that many of the replies would indicate that there are some exceptionally effective teachers in the ranks of dental teachers.

In the way of summary of the 159 replies it is evident that teaching in the field of dentistry calls for the type of preparation such as is required for successful teaching in any division of our educational system. This preparation may be said to consist of:

I. A high average of general scholarship and the possession of accurate knowledge in the field of instruction.

II. A knowledge of effective methods of causing students to do the work in a given course or field.

III. An acquaintance with students both individually and collectively.

Too many of us are likely to think of sound scholarship as the only requirement for the successful teacher. In forming this opinion we forget that the teacher must teach his subject to *individuals*,—the students in his classes. This is a truism in education, but one that cannot be repeated too often. In too many institutions one is given the impression by many of the instructors that the only thing necessary for an instructor to know is subject matter. Indeed, the opinion exists among some instructors in our higher institutions that to know anything about teaching methods, or the minds of students is beneath the dignity of an instructor. Such trivialities should be left to the elementary teacher, or at best to the high school teacher. Nothing, however, could be farther from the truth if the evidence in the 159 papers is of any worth. Of course, no teacher should undertake to give instruction in a subject with which he has not a very large measure of knowledge, and tho high scholarship and accurate information mean much for his success, they are not the only elements in this success. The instructor who does not attempt to know something about the students under him, who does not recognize the problems of fitting his instruction to their needs, interests, and capacities, is in grave danger of failing. The effective instructor is the one who knows his subject and at the same time knows how to impart it to his students.

Now, what do dental students appear to desire as a part of teaching practice?

In the first place, dental students desire to be held to strict account for the mastery of certain fundamental facts and principles. It is evident from the 159 replies that dental students are not averse to hard, exacting work. However, dental students, as well as students in other fields, object to aimless indefinite teaching with the course so organized as to establish little or no connection between readings, lectures, laboratory work, and quizzes. They want to have a knowledge of the purposes of a course and have all of the assigned work contribute directly to the realization of these purposes.

Among the suggestions offered in the papers for conducting a course in such a way as to hold students to a strict account for the mastery of certain fundamental facts and principles are the following:

1. Frequent short written quizzes on important principles or problems. In the opinion of students such quizzes reveal weaknesses and misunderstandings in a very effective manner.

2. Frequent oral quizzes carried on with the aim of discovering the difficulties encountered by students rather than with the aim of "trapping" students. Note that these quizzes should be from the students' point of view, i. e. organized to help the student.

3. The giving of such directions in connection with outside reading assignments as will enable students to fix their attention upon essentials.

4. By such an amount of repetition in lectures and thru laboratory problems as will insure complete mastery of important facts and principles. Mere memorization for the immediate present, i. e. cramming, is not considered valuable by students of dentistry.

In the second place, dental students desire to be given direction as to the use of theories and principles in the solution of present or future problems. The suggestions offered in the papers for doing this are numerous, among them being:

1. The use of the actual experiences of the instructor showing the application of certain theories to genuine problems in the field of dentistry.

2. The recalling of experiences of students in previous laboratory work and the analysis of these experiences, in terms of the new facts or principles.

3. The anticipation of problems likely to arise in laboratory or future dental practice and the suggestion of the relationship between the theories under discussion and the future problems. Many problems of this sort can be brought to the attention of students by the use of charts and slides.

In the third place, dental students desire an instructor to conduct a course in such a way as to require the cooperation of the members of the class. The lecture course without accompanying discussions or quizzes *does not* involve the type of cooperation which is, in the opinion of dental students, the most valuable.

In the fourth place, dental students wish such definite and clear assignments of work as will enable them to prepare to attack their assignments in an intelligent fashion. To do this an instructor must have very clearly in mind the aims of the course as well as the materials and problems necessary to the attaining of these aims or ends. To do this, an instructor must organize the work for a semester or year, rather than organizing it from day to day and depending upon occasional inspirations to take care of the number of hours assigned to the course.

In the fifth place, dental students wish to be treated as individuals rather than as a group, that is, they want an instructor to discover the particular needs

of individuals and adapt instruction and requirements to these particular needs. To do this effectively, an instructor must have sufficient time to get acquainted with the students as well as an inclination to interest himself in the individual student. It should be noted that the "inclination to interest himself in the individual student" is stressed as this "inclination" will serve to overcome many difficulties presented by crowded sections or outside professional demands.

To illustrate and to furnish concrete suggestions as to effective teaching practices, I wish to quote from nine of the papers submitted by the 159 dental students.

Student Number One says:

"The course in Organic Chemistry was very effectively taught, because:

First: The significance of the subject was fully explained and a bit of *interest aroused.*

Second: The instructor worked on the theory that a few essential facts completely mastered were preferable to a great many less important facts which only serve to confuse the student, and take the form of 'hodge-podge' in the brain.

(a) He lectured slowly and emphatically, and any point that the class could not comprehend, he would repeat until everything was clear. If the class did not understand, he assumed it was the instructor's fault, and he took greater pains to make them understand.

(b) By preference of the class, he issued lists of questions, very complete in their scope, and it was understood that all examination questions would be found in these lists. Thus none but the slowest failed to learn the answers to most of the questions."

Student Number Two says:

"I feel that Physiology is the most efficiently taught subject in the dental curriculum. Students are required to study the text previous to attending well-arranged and well-classified lectures. The lectures are frequently accompanied by demonstrations having a direct bearing on the subject at hand. Then, to determine whether the student grasps the subject, he is quizzed frequently. Often the students are given one or two written questions for the first five minutes of the class period. These questions are afterwards discussed in class till clear in the minds of every student. This leaves no chance for anything, but a clear conception of the subject, and this plan appeals to me as the most scientific of all methods of instruction."

A third student declares:

"Several courses have appealed to me, but the lecture course on Prosthesis has been most effectively presented. This is due to the clear reasoning power of the instructor, his knowledge of the subject, and practical experience. There is also thoroness of presentation and constant repetition. In a word, the instructor has something to give, and the power to drive it home."

A fourth student declares:

"I think Physiology and Histology have been given in the most efficient manner. In Histology, we have lectures, laboratory, and quizzes. In Physiology, we have demonstrations, lectures and quizzes. The lectures are carefully outlined so that it is easy to follow and take notes. In the laboratory, we are shown what the structure of the tissue is, and by the demonstrations, we see what actually takes place when foods are taken into the body. Everything is made clear as we go along. In quizzes one gets a broader vision of the subject and it is better fixed in the mind."

Student Number Five says:

"The course in Anatomy was best presented because it was presented objectively. At one time the professor, discussing the heart and its circulation, drew, with chalk on his dark suit, the

heart and its distribution in so far as the larger vessels were concerned. An illustration, either from this professor's personal experience or manufactured via his imagination, followed in nearly every case when a new subject was introduced, followed by more illustrations and objectives. Personally, I believe that the success of an objective teacher depends upon how much he knows about the subject and how much personal experience he has had in that line."

Student Number Six replies as follows:

"In Pathology the Professor knows his subject. He has chosen for the course, the most fundamental and important facts. He repeats the important and hard things to understand in his lectures. Also he delivers his lectures in a tone loud enough to be heard, slowly enough to be emphatic, with humor enough to keep one awake, and with examples enough to keep the class interested. He also feels that his subject is interesting. His lectures are so complete that the textbook is used only for reference. His quizzes are taken from the lectures. He insists on honesty during quizzes, not allowing cribbing.

"The laboratory course is to bring out and to emphasize the material given in lecture. It is also of value. It is given parallel with the lecture course. In it the whole class is together, not one ahead of the other. Also all things are sufficiently explained."

At this point, I will take leave to change the tone of these contributions and will introduce one contribution from a dissatisfied student. It sometimes happens that disgruntled parties offer much in the way of suggestions as to practices to avoid. This dissatisfied student declares:

"No previous course has been outstanding in its method of presentation. The ordinary methods of college teaching have been used—namely:

1. Lectures were given either independently of the laboratory work, or after the laboratory was done and the enthusiasm had vanished, or even before the laboratory work was begun.

2. Lantern slide-lectures containing illustrations taken directly from the standard text-books.

3. Announced written quizzes so that we could cram up and then forget.

4. Very few oral discussions, hence no spontaneous discussions arose in class and few out of class.

5. Very few practical demonstrations."

He adds: "Special help has been derived chiefly from assistants in laboratory, as I wasn't afraid to ask them questions."

He concludes by saying, "After all, I learned what little I know by self-application."

Student Number Eight is more enthusiastic and declares that:

"I think the most efficient methods of presenting a subject are demonstrated in the course in Human Anatomy. The reasons for this belief, are as follows: The instructor is always on hand to answer any question asked, and not only answers your questions, but, also, tries to find out what you know about it, and if he thinks that you are not well posted on any phase, he will help you out. In trying to impress certain points, he usually associates some incident that will help you to remember. In his quizzes, he is fair, giving all the chance that is necessary, and when you do not know it, he gives you another chance. He makes everything perfectly clear before leaving the topic. Altho there are no lectures in the course, the discussions with the instructor help. It is far better, in my estimation, than the lecture. I think in this course, the assistant means everything. I might add that I am in a small laboratory where the assistant has only eight tables to care for."

Student Number Nine declares that:

"High efficiency has not been demonstrated in any of my previous courses in dentistry, altho the course in Dental Anatomy was fairly well presented. This efficiency was due, in the first place, to the lecture method. The instructor assumed nothing. He wrote out on the blackboard the words that were very long, and which could not be easily remembered. This enabled the student to get the correct spelling and to carefully fix the words in his vocabulary. He next used personal incidents. He assigned readings after the lecture, and held frequent quizzes on the lectures and readings."

In conclusion, all of us engaged in teaching in any branch of the educational system, whether high school, literary college, or professional school, need to recognize the fact that our students are constantly measuring the success of our teaching methods. In this paper, I have attempted to emphasize this fact. I have also presented some of the best suggestions submitted by students for the improving of teaching procedure in the courses in dentistry. I believe that these suggestions are valuable and my confidence in their value is increased by the fact that the two previous speakers, Dr. Thornton and Dr. Friesell have outlined teaching practices which completely satisfy the five principal teaching standards of dental students as gained from a summary of the 159 replies to question two. These five teaching standards may be formulated as questions for an instructor in dentistry to ask of himself. In this form, the five standards read:

First: Do my teaching practices hold the students to strict account for the successful mastery of certain fundamental facts and principles?

Second: Do my teaching practices provide adequate directions as to the use of certain theories and principles in the solution of problems likely to arise in actual dental practice?

Third: Do my teaching methods stimulate teacher-student cooperation in the discovery and solution of problems?

Fourth: Do my assignments of outside readings and laboratory work include such directions as will enable students to undertake the work in a profitable time-saving manner?

Fifth: Do my teaching methods take account of individual differences and needs?

As instructors, we need to develop a more critical attitude toward our teaching practices and to seek to discover our own strength and weaknesses, not weaknesses only. In fact, I know of no more certain way to raise the general level of the efficiency of instruction than to cause the members of a teaching faculty to analyze their own teaching practices, to try to measure the results attained by the following of certain practices, to compare notes with other teachers and to develop a willingness to revise their teaching practices from year to year to the end that the greatest results for each and every student in the course shall be secured. I, therefore, encourage you to become critical of your own teaching practices.

OPERATIVE MANAGEMENT OF CHILDREN'S TEETH.

By EUGENE MAGINNIS, D. D. S., Chicago, Illinois.

(Read before the Englewood Dental Society of Chicago, March 9, 1920.)

IT IS unnecessary to convince the conscientious dentist of the need for dental care for children. Preventive dentistry in every phase has become an established fact. Therefore, in this paper I shall consider only those cases which have reached the operative stage.

The procedures in the treatment of children's teeth would present few difficulties were it not for the problems connected with child control. Most modifications necessary in the methods practiced for adults in the actual operations are due to limitations of endurance on the part of our small patients, and their unwillingness to submit to dental procedures. Therefore, in the presentation of this subject, management of the child is the first item to occupy our attention.

Kindness, firmness and honesty are the fundamental principles to be observed. To gain the confidence of the child and allay his fears, real and imaginary is necessary to succeed with him in dental procedures. Much headway may be made toward gaining his confidence by a greeting of frank kindliness and a jovial, but dignified manner. When the child is in the chair, do everything possible by word and manner to impress upon him that he will not be surprised and that he can depend upon what he is told in regard to what is to be done; not that it is desirable to tell what we are going to do in detail, but upon approaching the child at the chair and before any work, even the examination of the mouth and teeth, especially if the child seems frightened or suspicious, make it a practice to tell him and impress it upon him that he will not be surprised, that if he is to be hurt he will be told so.

The child is almost invariably beset by fears. There is the real fear for those who have some conception of what dental procedures are from previous experiences, as well as a natural fear of everything with which he is unfamiliar. There is the awe of the strange equipment and the fear of the terrible things which his imagination conjures and he expects to be practiced upon him. Many times very grotesque to the adult, but very real to the child. Then there is the fear which has been deeply implanted by many repetitions of dread of the dentist by parents and other adults and by his child associates. For all of these reasons every effort should be made to gain his confidence by sympathetic reassurance and to preserve it by keeping faith with him.

The desirability of the parent's presence is a matter which must be determined by conditions apparent with the case in hand. At times the attitude of the parent is a hindrance; at others the parent is a real help. Many times the child is much less panicky with the parent near. The father's presence often seems to have a marked effect on the child's willingness toward accepting treatment.

The operator should be in good physical condition and thoroly rested. Morning is the desirable time for children. It is surprising how much easier the operation for a child goes at the nine o'clock hour rather than in the late afternoon, when both child and operator are tired. Because of this, the late afternoon

time should never be used for a child except in an emergency. The operator must, at all times, be nervously relaxed and not feel hurried. He must never transmit anxiety or nervousness to the child by allowing himself to appear so, notwithstanding the fact that he must work rapidly. The operator must train himself to make every move effective. All materials and appliances which possibly can be, should be ready before beginning the procedure, for even an exceptionally good child's nervous endurance under the stress and discomfort of dental procedures is comparatively short,—an hour is about the maximum. A shorter period is usually better. The operator must never show impatience or disturbance regardless of any anxiety to be thru, or of any misgivings or fear of results which he may entertain. He must always maintain to the child the bearing of absolute ease; and confidence in the result; and in the fact that the needful work will surely be accomplished. Many times when the child is objecting, or putting up a fight, as they often do, even after all kind and persuasive means have been used and exhausted, it is well to tell them that the thing we are attempting must be done, and then proceed to do it regardless of any objections from the child.

A child instinctively senses a real sympathy and the operator must possess that for him if he is to accomplish the most possible. Any confidence the operator has imbued up to this point must be definitely fixed and encouraged by promises which he can absolutely make good. The impulse comes many times, especially by others to say to the child, "It won't hurt," when it is meant to convey the idea that we do not want to hurt him, that he will not be harmed or that the operator will be careful, will not be rough or unusually severe. Never make such a statement to a child or allow anyone to make such statements to him while he is under treatment, and warn and advise against it at other times.

Much can be gained by suggestion and no one is in a position to so well do that as the operator, who knows what has been accomplished and what he is to do next. Again, a knowledge of the child's attitude toward dental work and the especial operation in hand is a matter which the operator learns to understand, and conversation and encouragement by the operator when rightly directed is a great help in the control of the patient. For this reason, when it is desirable or necessary, request the person in charge of the child to refrain from talking during procedures; allowing the operator to direct the conversation, instruction and suggestion.

It is often well to do several slight operations when possible at the first appointment, where a definite promise not to hurt can be made and kept, before attempting anything sensitive or painful. Then, when we are necessarily going to hurt, or there is a probability or even a possibility of it, tell the child, "This will hurt a little," or "This will hurt some," or "It will have to hurt now, but I will be careful," to which there may be a protest; but the child has learned to know that you are giving him the facts and that he may depend upon your word. It is better for the operator to protect himself against unexpected hurts and pricks by telling the child, "This may hurt a little," even if we do not expect it to hurt, than not to keep a "no-hurt" promise. He will forgive the failure to hurt even tho he has been prepared to expect it. However, failure in a definite promise not to hurt will be remembered, to the damaging of his confidence, and repeated failure will cause a loss of the confidence already gained and damage his faith in others. The promise to be careful is very effective and one which may always be kept, and when made and kept is comforting to the little patient. It becomes a source of satisfaction to have so managed the child that following what may have been a severe operation, he, while he dreads

other ordeals, and may protest against return to the office, is not resentful toward the operator and indicates and expresses confidence.

The pride of the patient, especially of the boy, in the matter of his courage often may be appealed to. Praise, and suggestion of competition real and imaginary will be useful in increasing morale in many cases.

When the child has been treated thus definitely and considerately, it is a pleasure and satisfaction to realize how much more easily and how much better the little patient is controlled at each succeeding appointment altho the operator at the first meeting may have wondered if ever he would be able to accomplish anything for or with the child.

Sometimes in very young patients, and occasionally in older ones, when all ordinary measures have failed and they are determined to resist ministrations in spite of any appeal, it may be found advisable and necessary to resort to force enough to accomplish the result. Even then let it be in the spirit of kindness tho applying the "strong-arm" methods, which, aside from accomplishing the purpose in hand may have a very wholesome effect upon the patient, demonstrating to him that his fight is of no avail and that he will really fare better by omitting the resistance. In carrying this measure thru it is desirable where possible to select an operation which we are sure can be performed regardless of any resistance and proceed to its immediate accomplishment. Such a procedure successfully executed is very effective and usually is sufficient to convert the individual into a good patient. When he realizes that the operator is as determined as he is and succeeds in spite of his resistance, and incidentally that the operation is not as bad as he imagined it would be, he is quite likely to see the futility of his fight and submit in the future to what he has found to be inevitable.

However, no operation should be carried to the point of breaking down the child's courage and spirit, or breaking down his nervous system—better that the operation fail than that. Nevertheless, when it is at all possible without overtaxing the patient, and danger is remote for most operations up to an hour's duration, a definite result should be obtained,—the objective should be reached. It is better for the progress of the work and for the spirit of the child. Appointments too near together are not advisable, except in necessity; once a week is often enough.

For the encouragement of those who have had disappointing experiences, the writer wishes to state that he has had many cases which appeared impossibly at first, and recalls none, which, eventually, it was not possible to care for; most of them with real cooperation from the patient and others, with surprising resignation, at least. Let me repeat, the fundamentals of child management in dental procedures are kindness, firmness, and honesty, expressed by a real sympathy and interpreted by an appreciation of the disagreeableness of dental operations to the child at the best; coupled with this should be a conscientious desire to really do something thoroly and definitely for him; remembering the fact that anything in dentistry done well requires patience, painstaking effort and practice, and that this fact applies as thoroly in operating for children as it does in operating for adults. While it cannot be disputed that some persons control children easily, while others are not so successful; yet there is something in the approach which gains the child's confidence that can be cultivated in a large degree.

In filling and treating teeth for children, one realizes more and more definitely that aside from conditions we must meet in operating due to childhood; the differences and modifications in their management are only those incident to

the physiological changes due to the growth and development of the teeth and jaws; and one should avail himself of anything aiding in the definite attainment of results. Therefore, notwithstanding its difficulties and at times its impossibilities, the successful application of the rubber-dam is always a help in operative procedures, because it is much easier and more effective to operate in a dry field, and the tongue and other tissues are prevented from interfering. When the patient has reached the age where the clamp may be placed on the first permanent molar, the use of the dam is usually not a difficult matter, but, owing to the gingival constriction of the deciduous teeth, the using of any clamp, now at our disposal, on them is almost impossible because of the discomfort and pain caused by the pressure of the clamp upon the jaws, and trouble is started before the vital part of the operation is begun. I have had in mind for some time the devising of a clamp especially for use on deciduous molars; a clamp which should include a stop of some sort to prevent its slipping too far gingivally and that might be so constructed that the jaws would be broad and contoured to hug the tooth closely in a clasp-like manner.

Cotton rolls often may be used to dam off an area and are effective for short operations. Many times by permitting or instructing the patient to hold them in place, he is given something with which to occupy himself. The concentration of his mind upon some definite object serves to keep him otherwise quiet and he is often pleased and complimented at being allowed to help in the procedure.

The most opportune time to care for the carious damage of deciduous teeth is before the pulp is involved. Because of the great difficulty of managing pulp exposure and owing to the danger of and from focal infection in the apical areas, one thing is certain and that is that every effort should be made to prevent the condition from arising which will necessitate the devitalization or cause the death of the pulp. Such a condition is best prevented by teaching parents to bring the child to the dentist early and often. Caries has been observed in children at the age of two years and occasionally before. Certainly, at three years it is wise to make an examination in order that any liable area may be found and noted and that actual decay may be cared for.

The treatment of caries of the deciduous teeth does not differ from the treatment of caries in the permanent teeth. It being only a matter of condition incident to the child and its control, and we will do well to bear this in mind in procedures in which the pulp is not involved. The occlusal cavity is, of course, simple and easy. For the ordinary pits and fissures, break down the overhanging enamel with the chisels or other enamel instruments and remove the decay with spoons or round burs, being careful to avoid possibility of pulp exposure. Then fill with amalgam; the presence of moisture is not a disheartening feature, for while dryness is desirable, if possible, when this ideal condition cannot be obtained, fillings may be made with this material, regardless of moisture. Anything which can be done with safety towards providing a square base for such a cavity is advisable, but conditions and circumstances must guide such undertaking. When it comes to extensive occlusal decay, the spoon is often the only instrument needed for excavation. The decay should be removed from the cavity walls and periphery first, then remove the decay in the body of the cavity. When the debris and decay have been carefully and thoroly removed, if the pulp is not exposed, then the cavity may be filled as usual. If the pulp has been approached closely, especially, and generally any way, it is good practice to use cement and amalgam in combination. When

everything is ready, and the cement on the slab, mix the amalgam and lay it in an accessible location; mix the cement and flow it into the cavity fairly thick, and immediately pack the amalgam. The cement is useful and desirable in two ways: If the pulp is slightly exposed it forms a capping; and in any case it acts as an insulation and by serving as an attachment for the amalgam becomes a substitute for a square base.

In proximal cavities the procedure is, first to break down the enamel of the marginal ridge, and with a spoon excavator of suitable size, remove the decay. Then trim the walls, buccal, lingual, and gingival, to outline form with the enamel hatchets, the last step being to cut the step for retention on the occlusal. This cutting may only be sufficient for retention, since extension for prevention is not so urgent in the deciduous teeth as it is when operating on the permanent teeth. Many times the retention can be obtained in the proximal portion of the cavity and no step will be necessary. In cutting the occlusal step, care must be taken not to go so deep or wide that the horns of the pulp are in danger. I use, for this purpose, either an inverted cone bur, size 34 or 36, or size 557 cross-cut fissure bur. The fissure bur has the advantage that it may be used to obtain the outline in the enamel first. I prefer the fissure bur for the proximal cutting and use it a great deal for the occlusal step. In cutting the occlusal portion, I find it good practice to start in the groove and cut buccally and lingually in the non-sensitive enamel—that is why the cross-cut fissure bur is so good—to about the shape and extent that I am going to make the step. Then, when the deepening is made for the strength of filling material, the cutting in the dentin may be made rapidly and easily, so that many times only one effort in the sensitive portion may be necessary. A bur a size or two larger is advantageous for the final enlarging of this step. We now have a proximo-occlusal cavity which, many times, has been obtained with scarcely any sense of hurting, which may be filled as effectively as a cavity in a permanent tooth. Many of these cavities will need no bur in the proximal portion at all, the removal of the decay, and the marginal trimming, giving a satisfactorily formed cavity. If the decay is slight, some extension may be advisable.

If the cavity, the preparation of which I have just described, is in the distal of the first deciduous molar, and there is a small affected area on the mesial surface in the approximating second deciduous molar, I many times, while it is accessible because of the cavity in the distal of the first molar, take a round or inverted cone bur and simply remove the decay, making no extension, except to sound tooth structure, for cavity walls, and fill this cavity with amalgam first, thus caring for such a surface with a minimum of time and effort, and also with minimum discomfort to the patient. This filling is accomplished with an area of about one and one-half by two millimeters in diameter on the proximal surface, and will protect the tooth for from several months to years. And a few months added to the age of the young child will work wonders in his willingness to be controlled.

I make an almost universal practice of filling vital deciduous teeth without the use of the rubber-dam or other efforts to keep the field dry, and unless a pulp condition prevents, I use always a metal filling, usually amalgam. At one time, I used inlays of gold and silver, and may again; but when I determined that amalgam would pack beautifully under saliva and adopted its use in that way, much of the difficulty in management of cavities in children's vital teeth disappeared. In filling proximal cavities I cut a small matrix of steel, slightly larger than the proximal surface of the

tooth on which the cavity occurs, and conform it to the said surface, slightly more concave, so that the spring of the pressure against the approximating surface of the adjacent tooth will help to keep it in place. Then I lay it aside and mix my amalgam. When that is ready, I place the matrix, and holding it with my fingers, pack the amalgam, as I said previously, paying no heed to the presence of saliva. When the cavity is packed full, I remove the matrix carefully with a pair of strong forceps and burnish and finish the filling as I would any other.

The anterior teeth present such a simple and easy problem, I will not burden you by taking time to consider them separately in this paper.

While we have access to all the filling material for deciduous teeth, I use amalgam for nearly all fillings. It can be worked any place and with definite assurance that it will arrive. If one is filling a nicely dried cavity and something happens to flood it—a tongue wiggles at an inopportune time or worse, a fragment of filling material falls on it, etc., and then saliva floods everything—one can go serenely on and pack the cavity with amalgam and the operation is successful anyway, even tho we should have been more pleased to exclude the saliva until the filling material was placed. Besides being a material that may be easily handled under trying conditions, amalgam may be relied upon to maintain the contour and contact of the teeth and the space in the arch.

Cement has its use, but for me it is a limited use. It is employed only in capping pulps in the filling of anterior teeth, in filling cavities where the pulp is so badly exposed that whatever one uses must be flowed into the cavity, and for forming the base in large occlusal and other cavities, especially when the pulp has been closely approached. Reference has been made to its use in cementation of natural defects, but as for the desirability of caring for teeth in that manner, I have been so doubtful that I have never attempted such procedure. I have always feared that I would be covering up a crevice in which decay had already begun and, therefore, palliating and condoning trouble, that would accomplish all the more harm because of the false assurance that the tooth was protected.

Gold may be used as an inlay and does beautifully.

Silver also may be used as an inlay. When a tooth is so broken down that an ordinary filling will not stay well or where it is not possible to place it for any reason, then, after the cavity is cleared of decay a wax pattern may be made and a cast restoration effectively employed.

It may not be out of order here to remark that Dr. G. V. Black in his Operative Dentistry, under the "Management of Children's Teeth," cautions against using silver nitrate in cavities of teeth unless we are sure the pulp is protected by at least a thin layer of sound dentin, on account of the severe pain resulting from its contact with the exposed pulp. There are undoubtedly slight surface decays which may be arrested by the application of silver nitrate, but I have never found it especially useful in retarding decay in children's teeth. Whether the ammoniacal solution, as suggested by Dr. Percy Howe, is painful under the condition of pulp exposure, I cannot say, having never tried it.

I will now take up the consideration of some of the conditions where the pulp is hopelessly involved. There are, at least, four common ones which may cause a child to complain of toothache. When pain is more or less continuous and the child has been prevented from sleeping, we should expect and usually find an abscess, the symptoms of which are pain, soreness to percussion or pressure, and swelling. When pain is complained of at intervals or occasionally, or occurs during or following eating, exposure of the pulp is generally indicated. Again, where proximal

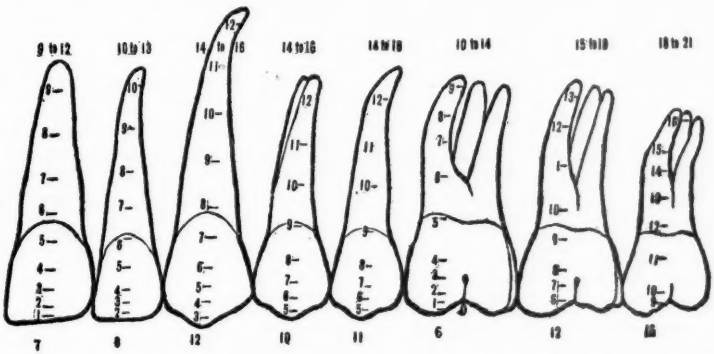
decay is present in the first and second deciduous molars, or at a later period in the second deciduous molar, altho this decay may be slight, it may be sufficient to permit the jamming and packing of food upon the interproximal tissue, causing soreness, and pain from pressure and inflammation. This condition is easily remedied. Restore the contour and contact with fillings and the trouble disappears. Another source of complaint may be due to the phenomenon of reflex pain, especially from middle or other ear infections. When we are unable to find reasons for pain complained of about the teeth of the child, sometimes pressure on the external meatus of the ear will call forth a response, indicating tenderness and soreness in that region, which will immediately help us to refer the case to the proper place for relief. When decay has reached the point where the pulp is exposed, we are confronted by a delicate operation. Slight and clean exposures may be capped by flowing cement over the exposure and filling cavity with amalgam. In cases where the cavity is too small or other conditions will not permit of capping and amalgam filling, the cavity may be cleaned out, dried, and cement flowed in to cover the exposure and also to entirely fill the cavity; but amalgam is preferable wherever possible, especially in proximal cavity. Exposures and cappings should be watched closely, however, for death of the pulp following such conditions may occur. To me, an exposed pulp in a deciduous tooth is just where the trouble begins. To my mind, this is the only condition in caring for children's teeth which approaches the impossible, but it does not warrant us in not attempting to do all that is possible for such cases. Theoretically, such teeth can and should be devitalized, and I have done so; but the difficulty of securing and maintaining a dry area and the possibility of carrying thru the operation within the time-endurance of the child, makes it well nigh impossible and sometimes actually so. I am of the opinion that with a set of suitable clamps for the deciduous teeth much more can be done for these cases. Devitalization may be accomplished by pressure anesthesia. Also arsenic may be used, but one should be sure that the roots are completed and that absorption has not begun, and then there is a question as to the safety of employing the method. Radiographs should be made to determine the root condition before any devitalization treatment and especially before arsenic is attempted.

The illustrations herewith will serve to refresh the memory upon the development and calcification of the deciduous and permanent teeth as well as upon the time of beginning and progress of absorption of the deciduous teeth. All of which should be considered in undertaking operations upon the root-canals of deciduous teeth.

The procedures for root filling of deciduous teeth are the same as for those in the permanent teeth. The field should be isolated by a rubber-dam or by other methods to secure a dry area, not only that we may have a sterile field, or as near a sterile field as possible, but if we can apply the rubber-dam we can work that much more rapidly and effectively. The filling of these canals should be done with gutta-percha. The length of the canal and the apical diameter and size should first be determined by passing a root-canal plugger into the canal until one of sufficient size is selected, one which will pass to, but not thru, the foramen. This instrument should be bent at the point where it lies against the rim of the cavity when it is inserted in the canal to the end. Then with the canal dried and moistened with eucalyptol a short piece of gutta-percha root point, large enough to seal the apical foramen, should be attached to the end of the root plugger. This gutta-percha, slightly warmed, is passed into the canal and packed at the apex. The initial

piece is to be followed by others till the canal is filled and the process is repeated for all the canals in the tooth at hand.

It seems to me that we should not be over anxious if we fall slightly short of absolute thoroughness of root filling in deciduous teeth, because of the fact that the roots with which we are dealing are subject to absorption, and which may have already begun, or will occur later. Do not conclude from these statements that I counsel in any manner laxness in any of the procedures in caring for children's teeth. On the contrary I urge all to, and in procedures do, exhaust every means to thoroness. But there is a point where thoroness must be governed by conditions that warn the operator not to continue the operations beyond the individual's endurance, either physical or mental. What I wish to suggest is that the importance of exact apical perfection need not disturb us so much in the deciduous as in the permanent teeth, because I have the assurance of clinical evidence as well as assurance from the teachings of Dr. G. V. Black that absorption of these roots will go on after root filling as in those of vital teeth if these roots are not chronically infected. If, in working on these roots, it is apparent that absorption has already begun, it seems logically possible to me, because of the



A diagrammatic representation of the calcification of the permanent teeth. The teeth of the left side of the upper jaw are represented in outline. Below each tooth a figure is placed which represents the average year of the eruption of that tooth. Upon each tooth figures are placed at intervals representing the date, in years, of the progress of its calcification to that time. The relation of the progress of calcification between the different teeth, or the contemporaneous calcification lines, may be found by following any individual figure from tooth to tooth. The figure 7, for instance, is at the junction of the middle and gingival thirds of the root of the central incisor and, reading from left to right, it gradually drops down to a little below midlength of the crown of the second bicuspid; it then jumps to about half length of the root of the first molar; then back to the junction of the occlusal and middle thirds of the crown of the second molar; it does not appear at all on the third molar. Any other year may be followed in the same way. The first of the two figures placed above each tooth represents a date at which the apex of the root of that tooth has frequently been found sufficiently narrowed to permit of root filling. The second figure represents the date at which the apex of the root is occasionally found too widely open for root filling. Even wider variations will sometimes be found. It must be remembered that in such a diagrammatic representation, only an approximation to a general average can be expected. Tolerably wide variations will occur. (*From Black's Special Dental Pathology.*)

above evidence, that we may fill these canals as usual, and absorption will be carried on. And if the gutta-percha is carried a trifle beyond the end, I am

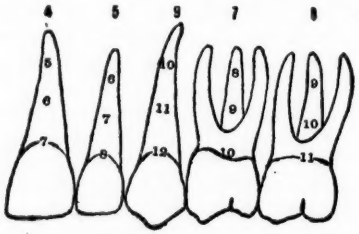


Diagram of the deciduous teeth, considerably enlarged, representing the absorption of the roots. The figure placed over each tooth represents, in years, the average time of the beginning of the absorption of its roots. The figures placed upon the roots of the teeth represent, in years, the progress of the absorption of the roots of the several teeth. Considerable variation from the general average, and also in the order of progress, must be expected. Not infrequently the absorption of the root of the second molar is completed before that of the first.

(From Black's Special Dental Pathology.)

encouraged that it will cause no serious disturbance of the physiological processes. All these conditions may be observed by use of the X-ray, and if unsatisfactory, extraction may be resorted to.

There is one fact which affords a great deal of encouragement in the treatment of all kinds of dead pulp cases, and that is the resistance to infection and the recuperative powers of children. The removal of a putrescent pulp is rarely followed by a painful condition, and a case presenting with a very sore or sore and painful and acute abscess will, in most cases, respond immediately to drainage and sterilizing treatment. The procedure for these is the same as for adult cases. The nearest approach we can make to a sterile field, which means an isolated field, by rubber-dam, or by rolls, the better. However, I have found that, owing to the natural resistance of the child, these teeth may be cared for in the presence of saliva, when dryness is impossible, without seeming complication. However, in the light of present-day

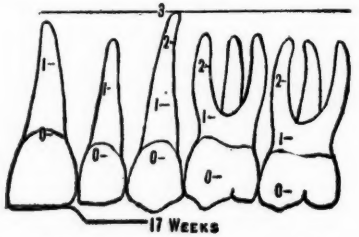


Diagram of the deciduous teeth, considerably enlarged, representing the progress of their calcification. 0, placed upon the individual teeth represents the progress of calcification at birth. The figures 1, 2 and 3 represent, in years, the progress of the calcification of each tooth. The intention is to represent averages. It must be understood that considerable variations will be found.

(From Black's Special Dental Pathology.)

theories on focal infection, I am not prepared to say that such procedure is good practice; and, where, in any way possible the field can be isolated, that is the procedure to follow.

The canals having been cleaned and sterilized, which should usually be accomplished in two or three appointments, the roots may be filled as usual.

Acute abscess should be opened and drained, and when soreness has subsided, may be treated as a simple putrescent case. Abscess, even when a sinus has been established, many times may be cleared up by such treatment.

In chronic abscess, meaning those especially where the abscess tract or sinus has been established, the determination whether we shall attempt to treat these cases and what shall be the extent of the treatment depends upon the age of the child, the development of the permanent teeth, and the extent of deciduous root absorption, and the bone conditions indicated by the radiograph, a means which may be made use of very effectively in all work connected with the roots of deciduous teeth. The procedures for treatment will be the same or similar to that for acute abscess. When it is possible, it is desirable to wash thru the tract with a bland solution, such as physiological salt solution, then seal in a dressing of creosote or Black's 1-2-3, and allow the parts to rest. Following this treatment we can carry the case thru in the regulation manner.

In the last analysis, the treatment of an infected tooth means cleansing mechanically by instrumentally removing any undesirable or foreign matter, by washing the area and by drainage; then medicinally by the application of mild germicidal or antiseptic drugs.

The indications for extraction of deciduous teeth are numerous; when molar teeth have been lost in the lower arch the corresponding teeth in the upper arch should be removed for the purpose of maintaining a harmonious relation in the upper and lower arch of a given side. The exception is that when a tooth is lost prematurely from any cause, especially a lower molar, then the space of the lost tooth should be maintained by an appliance. When teeth are badly broken down by decay and are dead, they should be extracted, especially when the development of the permanent teeth have progressed to the point near eruption. When teeth have developed apical abscesses which are a menace to the child's general health, they must be extracted regardless of their importance in the dental arch, but the space which they occupied must be maintained by some appliance until such time as the permanent teeth are erupted.

A very simple and effective appliance for maintaining space is the banded splint. It is constructed by making bands for the teeth either side of the space and the two bands united by a bar of iridio-platinum or of clasp wire of 19 gauge, and the appliance cemented in place. In case space has been lost or there is not enough, more may be secured by stretching the bar by means of the Lourie wire-stretching pliers. If it is desirable or necessary to maintain occlusion at the point of space, this may be obtained by so bending the wire so that it will come in occlusion with the opposing teeth thru the region of the central fossa.

Bridges may be constructed for children if it is desirable, and quite simply. For the abutments, seamless gold crowns may be constructed from impressions and dummies for the space included and the whole appliance cemented into position.

The technic for the gold crown has been given us by Dr. Chas. R. Baker, who uses them in many cases for his orthodontia appliances rather than the ordinary bands. An impression is taken of the teeth in modeling compound for which crowns are desired, the model secured, and all the teeth cut away from the model save one for which the crown is to be made. The gum portion of the

model should be trimmed away and the tooth carved to complete and perfect contour to the gingival attachment of the membrane. From this model is swaged a seamless gold shell, which is left without reinforcement, so that there is only the thickness of the plate from which they are made over the occlusal portion. These crowns should be trimmed so they will not impinge upon the gingival attachment and then may be cemented in place. The slight amount of thickness on the occlusal is accommodated by the depression of the crowned and opposing teeth.

Under present theories one could not in such a discussion ignore focal infection. I have taken pains to inquire of several men practicing pediatrics, and other medical and dental men, as to their opinion and attitude toward focal infection in children arising in the apical region of the teeth. Three of the four pediatrists were of the opinion that danger of systemic infection, especially, to young children from foci arising in the apical space was extremely rare. One was inclined towards the elimination of any teeth which were likely in any way to be a menace or in any way might possibly be a menace. One oral surgeon could see safety only in the elimination of any dead teeth. A dentist, trained in medicine and oral surgery, of clear and calm judgment was of the opinion that treatment of most dead pulp cases, if not all, could be safely undertaken, since most or all secondary infections in children were acute and from which complete recovery should be expected.

It is a serious matter dentally to remove even dead deciduous teeth ruthlessly and indiscriminately. I wish for my own satisfaction and peace of mind as well as for yours, that I could say just when we could permit a devitalized tooth to remain in the jaws and when it must be removed. However, since no person has been able to give us definite information in the matter and since opinions range all the way from those who say that after a tooth pulp has lost vitality, no one knows absolute safety save in the extraction of the tooth, to those who teach that the use of silver deposit treatment will make all teeth sterile and safe, it would be presumptious for me to offer a definite opinion. But it seems to me that there is absolute safety in those cases of dead teeth from which live pulps have been removed and root fillings made under aseptic conditions. Neither should there be much cause for alarm in putrescent pulp cases where no inflammation has extended into the apical space, or in acute abscesses where, according to G. V. Black, the peridental membrane is not destroyed. All these cases I think may be treated and filled safely. In chronic cases radiographic findings will be a factor in determining what should be done with them.

In concluding, I think a word on remuneration for dentistry for children will not be amiss. While ideals and conscientiousness should guide us in our work for children as in that for adults, and while when a case is undertaken nothing short of all that possibly can be accomplished for the good of the child should satisfy, regardless of compensation, yet I have always believed and maintained and tried to put in practice the idea that because dentistry for children required as much, if not more effort, and as much if not more skill to do it properly, as is required in dentistry for adults, it is worth at least as large a fee as would be obtained for other dental operations, and I am convinced that one will naturally have a better attitude toward work for children if he makes it a rule that that class of work shall be as remunerative as any other in his practice.

ORTHODONTIA IN THE UNDERGRADUATE CURRICULUM.

By A. LEROY JOHNSON, D. M. D., Boston, Mass.

(Read before the American Institute of Dental Teachers, Detroit, Mich., Jan. 27-29, 1920.)

FEW will question the fact that orthodontia has become an important part of dentistry and largely so thru the influence of the so-called "Postgraduate" schools. The men who have contributed most to the development of this phase of dental science are those who have studied in these schools. And it is the consensus of opinion among these men that a special course of instruction, distinct from that now given in the schools of general dentistry, is essential to one who is to practice orthodontia. I believe that I am right in saying that this is the view of the majority of dentists who have devoted much time and study to this field of work. Yet the impression one gets from a review of the proceedings of this Institute is that for the present it is better to build up undergraduate instruction and to raise the standard of preliminary requirements than to encourage postgraduate courses and special schools. Thus it might seem that those who claim the need of special schools for special training are opposed by the position you have taken, unless orthodontia is admitted to be an exception.

At the Tufts College Dental School we do not believe that the teaching of orthodontia is an exception, nor do we think that your attitude is inconsistent with the present needs of the subject. We believe that the apparent difficulty in determining the place of orthodontia in dental education is due to a confused idea of what constitutes the subject matter of the science and also to the fact that the difference between the aim and scope of the undergraduate school and postgraduate school has not until quite recently been recognized by those interested in the teaching of orthodontia. The so-called "Postgraduate" schools of orthodontia have been so only in name inasmuch as a greater part of the subject matter which they have presented has been substantially undergraduate material. In a way the development of these schools has served to emphasize the weakness of the undergraduate curriculum. The graduate seeking a solution to his problems turns to the methods and systems which these "Postgraduate" schools offer, when in most instances the inefficiency he feels is due to a lack of knowledge of the laws and principles of science fundamental in dentistry. He mistakes the shadow for the reality. Hence, we believe that the position which you have taken for a more thoro instruction of the undergraduate in the basic principles of his profession is not only the need of the general dentist, but will help more than all else to establish orthodontia in science. It will make possible the true postgraduate school which is a course of clinical experience and research. It will thin the ranks of faddists.

The following essay is an outline of

the subject matter of this science which, in our opinion, should be the basis of the course in the undergraduate school. No attempt is made to designate the way the material should be presented, nor do we specify as to the character of technic training. Our contention is that a knowledge of the fundamental principles of orthodontia is essential to a philosophic view of the basic truths of general dentistry, and also that it is only by teaching the fundamental principles of orthodontia in the undergraduate school that postgraduate courses can be organized, which will contribute substantially to the development of the science. Since our viewpoint will be considered by many of you as unorthodox it seems advisable to speak more in detail than would otherwise be necessary in addressing an audience of this character upon any phase of dentistry.

Dentistry is a part of medicine. Orthodontia is a part of dentistry. Hence to define orthodontia is to tell what part of dentistry it is. In our endeavor to do this we begin with a brief review of the history of general dentistry, bringing out the tendencies of theory and practice which have resulted in the development of orthodontia.

Now history can be presented in two ways; either as a catalogue of the chronological order of events or as an interpretation of tendencies. It used to be enough for historians to simply catalog the facts presented. They did not suspect the need nor did they realize the advantage of analyzing and comparing the vast accumulation of material at their disposal. To arrange it in chronological order seemed sufficient. In much the same way many make the history of dentistry little more than a review of early records, citing the dates of inventions and discoveries and the names of the persons associated with them. However interesting a study this may be, the material of dental history treated in such a way is of little practical value except insofar as it furnishes a groundwork for the consideration of the trend of circumstances. The practical utility of history lies in classifying and systematizing the events, changes, and developments of the past in such a way that they furnish a basis for the interpretation of present conditions and an indication of the probabilities of the future. The laws revealed in the analysis of the relation and trend of events provide a means of anticipating the future. Thus a study of the history of dentistry will make clear the development of knowledge which opened the field of orthodontia and, also, will point out its place in dental science.

The history of dentistry clearly indicates a progressive tendency toward the appreciation of the physiological nature of dental problems. During early periods, the treatment of the teeth was believed to be predominantly a mechanical matter. A carious tooth was filled with gold, a metal, or the tooth was mechanically removed and replaced by a metalic or porcelain substitute. Even the idea of prevention expressed itself in a manner of mutilation, the approximal surfaces of the teeth being filed away in an attempt to prevent the extension of caries. The vision of the dentist seldom went beyond the individual tooth or those immediately adjacent. But gradually the viewpoint changed. The effect of mutilation upon the form of the arch as a whole was noted. The teeth became the unit of a series; the series an interdependent part of the masticatory apparatus, and this a mutually dependent part of the whole individual. The dental problem, instead of being merely the mechanical consideration of the disposition of the individual tooth, became a study of the teeth in their relation to the life processes of the living organism as a whole. This extension of dental vision from the individual tooth

as as entity to the individual tooth as a unit of the whole, marked the dawn of the realization that dentistry is primarily concerned with a physiological problem rather than a mechanical one. While a knowledge of mechanics will always have an important place in dental science, we no longer attempt to employ simply the principles of mechanics in the study of dental problems. In the ultimate, the determining factor now is the consideration of the activities, processes and phenomena incidental to and characteristic of living tissues.

Today the purpose of dentistry is to assist in establishing and maintaining the normal functional activity of the masticatory apparatus, a part of the living organism. The natural forms and relations of the teeth are preserved and restored in order that the normal functional activity of the masticatory apparatus may be realized. The filling of a tooth; the treatment of an alveolar abscess; the construction of an artificial substitute, or the development of the supporting structures of the teeth by artificial means, in fact each and every operation upon or within the teeth is governed by the same purpose, i. e., to restore the normal functional activity of the masticatory apparatus. And it is because of the fact that the functional activity of the masticatory apparatus as a whole is the criterion of all dental operations, that the science of orthodontia is an essential part of the undergraduate curriculum.

The definition of Orthodontia ordinarily given is "that it is the science which treats of the correction of malocclusion of the teeth." In such a definition there is a suggestion of the fact that the subject matter of Orthodontia is a part of Dentistry, but as a definition, it does not convey a true idea of the science in its present state of development. Altho designating the character of a large part of the work that is being carried on in the name of Orthodontia, the definition does not identify the nature of the science as it is now understood. To say that Orthodontia is "the science which treats of the correction of malocclusion" places all emphasis upon the occlusal relations of the teeth and conveys no idea of the more vital factors which constitute the very essence of the science. Malocclusion is evidence of the perturbation of the physiologic processes; perhaps of natural disharmonies. At least it expresses phenomena more fundamental in the organization of an individual than the physical relations of tooth surfaces. The whole realm of clinical experience confirms this view and bears evidence to the fact that a definition which conveys a true idea of this field of work must designate a wider sphere of phenomena than merely the occlusal relations of the teeth.

The value of a definition is to make another understand what the word defined stands for. But as Josiah Royce once said, a definition simple, positive, hard and fast as it is, never tells the whole truth about a conception. Hence, rather than put too much emphasis upon the form of a definition of Orthodontia it is better to give an exposition of its scientific and philosophical position. In so doing refer to the science of Orthodontia as dealing with the fundamental activity of the dental arch as a whole and with the laws which underlie its growth and development. Refer to it as dealing with the functional interaction of the teeth; their supporting and surrounding structures; and the organism which treats of the forces controlling the form of the dental arch, and describe it as that part of Dentistry concerned with the deformities of the dental arch which interferes with its normal functional activity. Undoubtedly, dental orthopedia would be better terminology. It is more exact, and for this reason more truly identifies the field of work. Yet in view

of the traditional aversion to a change of name we hesitate to suggest that dental orthopedia replace orthodontia. Nevertheless, the nature of the orthodontic problem demands that we think in terms of dental orthopedia; that we broaden our vision and look thru and beyond the phenomena of occlusion to the life activities of the dental arch as a whole.

Thus the conception of the normal dental arch is fundamental in the study of the science of orthodontia. The same is true in all aspects of dental science, in oral surgery and pathology; in periodontia, prosthodontia and orthodontia, in whatever branch you will, the first and most fundamental problem is to evolve a scientific conception of the normal dental arch of the living human organism.

The normal dental arch is a physiologic complex. Yet there are many who treat the subject from the standpoint of anthropology. For example they limit their conception of the dental arch to the curved alignment of the teeth, saying with the anthropologist that "the arch is what the teeth have made it." Moreover, they consider the normal as a standard of type apparently forgetting that anthropology is concerned with the chronological, racial, social and even pathological groupings of man, while orthodontia is concerned with the life processes of men as living units. Anthropology deals with man collectively, orthodontia deals with men individually. The anthropologist studies the dental arch of man as a morphological characteristic which enables him to determine the place in the history of mankind of a particular group of individuals. The orthodontist studies the dental arch as a part of a living being. Hence to him it is a physiological rather than a morphological correlation, and he realizes that the teeth express but one of a complex of forces which determine the form of the dental arch. The teeth; osseous; nervous; vascular, and muscular tissues of the face and jaws, intermingle and blend into one another and are controlled in their mutual relations by the more dominant influence of factors involving the entire organism. From the very nature of the orthodontic problem, from the fact that the dental arch is a living part of a living thing, a dogmatic definition of it should not be given. The line of demarcation between the dental arch and other parts of the living organism is not absolute. All tissues blend thru an intermingling of structural elements, while the central nervous system and the circulatory system, the avenue of the internal secretions, maintain the fundamental unity of the organism as a whole.

In order to make clear the nature of the field of orthodontia it is necessary to define and to differentiate morphology and physiology, showing them to be different aspects of the same thing. Biological research of recent years has resulted in a transformation of the old ideas of the relation of morphology and physiology. Once considered as more or less foreign to each other they are now coming together on common ground. The belief is growing that a knowledge of either physiology or morphology taken of itself alone, is of little value as a basis for treating the living organism, especially as regards studies of development. A knowledge of the structural form of a bone or muscle or gland is of little consequence unless associated with it is a knowledge of the relation these characters have to the functional activities of the part during life. So a knowledge of the anatomy, histology, or embryology of the teeth; peridental membrane; alveolar bone, and surrounding muscles, is of little value to the practicing dentist without an appreciation of the interdependent relation of these parts. In dental and medical education, funda-

mentals are often referred to as a knowledge of anatomy, histology, embryology, and the physiology of nerve and muscle, but that which in truth is fundamental, that which does in fact constitute the basic knowledge upon which to build the superstructure of specialization whether of dentistry, rhinology, neurology or any part of medicine is a knowledge of the interdependent relation of living tissues, the fundamental unity of life phenomena. Muscle, tendon, bone, blood vessels and nerves all live as one; change one and you change all. To know how a bone is changed in its structural form by physiological processes and how dependent such processes are upon the nature of the structures involved is knowledge that is fundamental in the science of all medicine. Each science is valuable, it is essential, yet each one sees but one aspect of the phenomena of life. It is in bringing together the evidence of each one that the real nature of living tissues is revealed. Hence morphology and physiology, while being distinct branches of science, are in the ultimate treated as one.

In the study of the science of orthodontia, the dental arch is treated as a whole. The science takes into account the morphological characteristics of distinct tissues, and also the relation the different tissues and elements bear to each other and the way they act and are acted upon by each other in life processes. It brings into one concept the different structures treated in dental science and for this reason is necessary to a philosophic understanding of the basic truths of general dentistry. Philosophy signifies a concept of unity and variety. The study of the different sciences presents the variety; the study of the interrelation of the material of the different sciences presents the unity. The point of view of the science of orthodontia is of the unity of phenomena. Hence the knowledge pertaining to it constitutes an essential part of an undergraduate curriculum which assumes a philosophic purpose.

From the definition of orthodontia and an attempt to indicate its place in dental science we pass to a consideration of its organization as a science. It is important, however, to preface this with a detailed description of the means and methods of obtaining scientific data and also with the definition of the words and phrases which symbolize the logic at the basis of the scheme of organization—I refer to science; natural law qualitative and quantitative analysis; hypothesis and type.

A science literally defined is "knowledge which has been systematized and formulated with reference to the discovery of general truths or the operation of general law." A general truth is a proposition which sums up actual experiences and all knowledge relative to it goes to make up the subject matter of the science of which the general truth is the basic principle. Thus the science of mechanics, physics and chemistry generalize the laws of the relations to which matter and motion conform. Biology is a science. It treats of living organisms. The general truth upon which it is founded is the fact of life upon this earth, the reality of living organisms, and all knowledge of living organisms, all knowledge of the phenomena of life, goes to make up the subject matter.

In the same way the science of orthodontia must conform in its organization to the conventional standards of science in general; it must be founded upon a general truth or the operation of a general law and the material pertaining to this general truth must be so systematized that each new development will appear in logical sequence.

The general truth, or natural law as the basic principle of an organic science is called, upon which the science of orthodontia is founded is the law of occlu-

sion. From observation and comparison of the organisms of many species there is evident a certain uniformity of phenomena as regards the growth, development and structural relations of the masticatory apparatus. From the lamprey eel down thru all successive forms of animal life known to have a masticatory apparatus, including the dolphin with the simple conical tooth crowns and the elephant with the highly specialized dentition, thruout all, there is an order of sequence so invariable under normal conditions that a uniformity is readily recognized. In organisms exhibiting the most diversified forms of teeth there is a characteristic common to the majority which is that the goal of the growth and development of the dental arch is to bring the crowns of the teeth into some form of mechanical relation which will best serve the needs of the individual organism. This mechanical relation, this transient approximation of tooth surfaces, is called occluson, and uniformity of its appearance in nature is referred to as the law of occlusion. Thus the general truth about which the knowledge of the evolution of the dental arch is systematized and formulated into a science is the law of occlusion.

In the organization of the subject matter of the science of orthodontia a knowledge of occlusion is fundamental. The teeth are the primary factors in the evolution of the dental arch, and the principal function for which they exist is in the physical relations of their crowns. Moreover, the occlusal relations of the teeth are in a degree indicative of the developmental condition of adjacent structures. All of which designates the study of occlusion as the logical introduction to the material of orthodontia.

The subject of occlusion we handle in the following way: 1, hypothetical; 2, typical; 3, individual; the object being to approach in a logical way the question of normal occlusion of the individual organism.

In the consideration of hypothetical occlusion we begin by defining the word hypothesis in detail, and show that in the study of occlusion a hypothesis is as necessary as it is in other fields of investigation.

The formula of the ideal arrangement of the occlusal inclined planes of the teeth, so often described as normal occlusion, we treat as the hypothetical scheme of occlusion which serves as a basis of comparison in the attempt to determine the real nature of the occlusal relations of the teeth of human beings living today. This ideal scheme of occlusion is substantiated as a hypothesis (1) in the law of occlusion; (2) in the form of the occlusal surfaces of the teeth; (3) in the harmony of tooth form, character of occlusion and species. The law of occlusion testifies to the fact of some form of mechanical relation of the teeth that will best serve the needs of the individual organism. The design and plan manifest in the form of the occlusal surfaces of the teeth signifies a scheme of relation of a more or less constant and definite nature. The correlation of the form of the tooth, the character of occlusion and the race or group to which an animal belongs, a correlation, so evident in comparative anatomy, suggest a form of occlusal relations distinctive for man. The study of this hypothetical scheme of occlusion emphasizes typical tooth-forms and their relation to each other in a most effective way, but it should be made clear that such an ideal arrangement of the teeth is a theory which has sufficient basis in fact to justify it as an hypothesis in the study of actual conditions.

In the consideration of typical occlusion we begin with an exposition of the meaning of the word *typical,* showing the relation of the hypothetical to the

typical and the significance of the typical in the study of the individual.

Type is of the nature of an abstraction. It is the result of bringing together, of combining, in one concept a variety of structural relations, each different from the other, no two alike. Type refers to a composite. It is not a concrete thing existing in natural form. It is a model or pattern from which each individual presents some degree of variation. Hence it cannot be applied to the individual as a specific standard of measurement. The hypothetical scheme of occlusion is a condition assumed as a basis from which to determine the typical occlusion of a race or group of individuals, but just how near the typical occlusion of human beings living today is to the hypothetical scheme of occlusion we do not know. In order to determine this a systematic investigation of the occlusal relations of the teeth of many hundreds of the children and adults in the common walks of life would have to be made. Such an investigation is, of course, a difficult one; nevertheless, it must be done if we are to have a scientific guide in the study of the individual. Even tho it be assumed from the evidence of prehistoric specimens that an ideal condition of occlusion was born into the race, we do not know in what degree it is typical of man today. Inasmuch as many individuals have not survived to maturity, and development has been influenced by new combinations of physiological units and by environment, it is reasonable to suppose that more definite knowledge of conditions now existing would necessitate a modification of the belief that the ideal occlusion is typical of this generation. You remember that it was no less authority than Darwin who affirmed that organs and parts work well enough to enable an organism to survive, and recognized the possibility of improvement in their form and function. We emphasize the fact that the guide in the study of the occlusion of the teeth of the individual organism is the condition of occlusion which is typical of the race or group to which an individual belongs, and point out the inconsistency in the belief that a theoretical scheme of occlusal relations, even tho it has a basis in actual evidence, can be utilized as a measure of individual conditions.

The consideration of individual occlusion opens a wider field of phenomena. In fact, it brings us to the real problem of orthodontia, which is the question of the individual normal.

The problem of the individual normal is in reality a problem of normal variation as it refers to the dental arch of the living human being. Hence the study of the individual normal involves an exposition of the meaning of *normal*, and also of the material of science relative to the *phenomena of variation*.

Normal refers to a standard or rule which is observed or claimed to prevail in nature. In morphology the standard referred to is determined by the constancy, the prevalence, the frequency of the occurrence of a condition in the different organisms of a group or species. But when the object of consideration is the relation of an organ or part to the individual organism, the standard to which normal refers is of a different kind, yet even then it designates a standard as truly as it does in the group or species sense. The standard referred to in this instance implies a criterion of a functional nature. It refers to a condition which is most effective in maintaining in its most stable form the organization of the living being. Observation of the occlusal relations of the teeth of an individual enables one to ascertain in what degree the condition of occlusion approximates the typical. The occlusion of the individual will never be the same in all particulars as the typical, since

type is not a fixed point, but is an abstraction determined by the extent and direction of individual variations. In the species sense the occlusal relations of the teeth of the individual are said to be normal in that they come within the range of variation characteristics of the majority of the members of the race or group to which the individual belongs. They are normal in the sense that they possess many of the characteristics expressed as typical. But in orthodontia we are concerned with the welfare of the individual organism; we are more directly concerned with occlusion in its relation to the individual organism as a whole rather than with its relation to occlusal conditions of other individuals. Our problem is to determine in what degree the occlusal relations of the teeth and the form of the dental arch of the individual can vary from that which is characteristic of the species and yet express the conditions most favorable to the growth, development and life processes of the organism as a whole. It is a question of normal variation. And the standard to which normal refers in a consideration of the parts of an organism in their relation to the whole is of functional nature, not a fixed concept of structural form and relations. The collective or species normal is our basis; our guide; our ideal in the study of the individual but it should be made clear that the question of the normal as it refers to the relation of a part to the whole involves a study of life processes of the whole individual.

The study of variation implies a consideration of the essential constitution of living matter and of its manner of growth and differentiation. Inasmuch as a large part of the elementary material, especially as regards the internal causes of variation, is covered in other courses, notably in histology and embryology, we do not attempt its presentation in the course of orthodontia. It is more in keeping with the place of the science in the undergraduate curriculum to handle the material of variation in its broader phases. Consequently following an exposition of the meaning of normal we turn to the consideration of the law of variation; heredity as it refers to the transmission of modifications; the phenomena of habit and adaptation; the interdependence of function and structure; the influence of food upon variability; physiological versus chronological age bringing out the difference in rates of growth; the influence of use and disuse upon development and other expositions of the external causes of variation.

This, in a general way, outlines what we believe should be the basis of the course of the science of orthodontia in the undergraduate school of dentistry. The presentation of the subject-matter of the science as here indicated will give the undergraduate a knowledge of fundamentals which will make possible the true postgraduate course where the time is devoted to more specialized study; to the development of technical skill; to clinical observations and experience as well as to problems of research, all of which contribute to the growth of science. Moreover, such a course is essential to the student of general dentistry. In order to realize the effect of mutilation of the teeth upon the functional activity of the masticatory apparatus as a whole, one must know something of the forces which control the growth and development of the dental arch; in order to build mechanical restorations that will pass the test of practical utility, one must know something of the interdependent relation of living tissues; in order to recognize developing deformities, one must know something of the the study of orthodontia that the student of dentistry is brought face to face with such problems as these. Thus we believe nature of normal variations, and it is in

that the more thoro instruction of the undergraduate in the basic principles of his profession and the future of the science of orthodontia both call for the presentation of the fundamental principles of orthodontia in the schools of general dentistry.

DISCUSSION.

E. H. Smith, Boston.

You will all, I think, agree with me that we have just listened to the reading of a very scientific presentation of orthodontic requirements. None of us can grasp the full meaning of this paper just by hearing it read. One must read it not only once, but twice in order to analyze intelligently its full meaning. I have had the pleasure of reading it, and yet I cannot say that I have fully analyzed its meaning.

The essayist says that orthodontia has become an important part of dentistry and largely so thru the influence of the so-called postgraduate schools, and that the men who have contributed most to the development of this phase of dental science are those who have studied in these postgraduate schools. This, in large measure, I think, is true. Later in his paper he says that the so-called postgraduate schools of orthodontia have been so only in name inasmuch as a greater part of the subject matter which they have presented has been substantially undergraduate material. This seems to me to indicate that the undergraduate course in orthodontia has been of value. I am personally glad to hear this opinion from so deep a thinker as Professor Johnson, since I was, I think, the first to establish an undergraduate course in orthodontia in a dental school. It may be for this reason and for the further reason that I taught, at that time, the treatment of malocclusion, that I was selected by some one in power in the Institute of Dental Teachers to discuss Professor Johnson's paper.

The essayist speaks of the basic principles necessary to the understanding and practice of orthodontia, and also, he states, in the practice of dentistry. He presents in this paper an analysis of these basic principles. He states that dentistry is a part of medicine and that orthodontia is a part of dentistry. Gentlemen, for a long time I have been thinking that orthodontia is a direct and closely allied specialty of medicine, like orthodepics and pediatrics. Then let us begin at once to treat it as such.

Every man who has discussed here educational factors as they apply to dentistry has told you that the dental student entering upon the study of the sciences, which are the basic principles of dentistry and of orthodontia, is ill-prepared. And it means that we must give these men a deeper and broader idea in the sciences which underlie not only orthodontia but general dentistry. To that end the Harvard school will introduce in 1921 an advanced course in biology which I hope will meet the approval of Dr. Johnson. In the predental year, college biology will be necessary for a student to enter upon the study of dentistry. It seems to me that a course of this kind will prove of great value in the mental training of the dental student. This advanced course in biology would presuppose an elementary knowledge of zoology and botany as taught in the freshman year of the college. Its ideal purpose is to afford immediate technical preparation for the study of human anatomy, histology, embryology and physiology. It tends particularly to develop those faculties which are most inconspicuous in the high school graduate, yet most essential for study in medical and dental schools, the power of sustained effort in the observation, the analysis and the assimilation of unknown material.

Dr. Johnson presents a new definition of orthodontia and one well worth our

consideration. He defined it "as the science which treates of the forces controlling the form of the dental arch, and described as that part of dentistry concerned with the correction of the deformities of the dental arch which interfere with the normal functional activity of the masticatory apparatus." I think if that could be boiled down to a more condensed statement we could better carry that definition in our minds.

I still believe the undergraduate course in orthodontia is of great value. We do not expect to cover sufficient ground to really train the ideal specialist. A man, however, entering upon the study of dentistry may not know until he starts in whether he would like to specialize in orthodontia or not, but if he should decide in favor of it we have done him a great injustice unless we have given him the fundamental or basic principles so that he will not be handicapped when he starts in to study his specialty.

Our essayist thinks that dental orthopedics would be a better terminology. Since I believe it is a vital and important part of medicine I agree with him absolutely, and therefore I beg to suggest that dental be changed to oral and that the subject be called oral orthopedics.

I am unable to see with my present viewpoint why the orthopedist or orthodontist should take the general course in dentistry. If he is to specialize he should, it seems to me, enter a dental school with the pre-dental year of college work, and then enter upon a study of the medical sciences which have a bearing upon all medicine, specialties and otherwise. I do not see the need of his taking the general course in dentistry; I think this would be wasting very much time. Rather, he should take a general course in medicine, having the basic sciences presented in the masterly way in which the more important of the medical subjects today are presented, and then he should take enough of dentistry to qualify him in the technic; but he does not need all the technic the general dentist needs. His time can be better spent on the research problems underlying orthodontic conditions of which we know so little today.

H. A. Pullen, Buffalo, N. Y.

Dr. Johnson's most excellent paper, in a general way, will represent the average orthodontist's answer to the question of the basis of orthodontic instruction in the undergraduate school. He expresses the orthodontist's need of a fuller and more comprehensive curriculum of undergraduate work in order that he may not have to bolster up his lack of knowledge of certain phases of general medical subjects by postgraduate instruction, a sad commentary on the lack of efficiency of the undergraduate teaching.

With the present incomplete curriculum for undergraduate students, the graduate dental specialist has had to round out his education even along fundamental lines which ought to be furnished in the undergraduate curriculum.

Especially is this true of the specialist in orthodontia, who, in order to understand the field of his work comprehensively and practice it intelligently, must have a background in the fundamentals of general medicine which it is hoped the four-year course in undergraduate instruction in the dental schools will supply. Constitutional rather than local causes of malocclusion, dating back to parental and congenital factors, the effect upon the dental tissues of the febrile diseases of childhood, hereditary factors, habit neuroses, the effect of the internal secretions on development, have each in turn required a diagnostic ability on the part of the orthodontist equal to that of the best trained specialist in any branch of medicine, and shows the need for stressing what we have termed the theoretical

as opposed to the technical in undergraduate teaching.

If the orthodontist is to understand "the inter-dependent relation of living tissues" and to interpret the "fundamental unity of life phenomena" in the individual, and especially in the child, in order to practice the specialty intelligently, then the concepts of undergraduate instructions must lead up to a fuller realization of the needs of the specialist than it has in the past.

Dr. Johnson has very beautifully and artistically painted in the background of the basis of orthodontic instruction in the undergraduate school in his paper, which has my support as a teacher of orthodontia in both an undergraduate and postgraduate school.

The Postgraduate School of Orthodontia of Harvard Dental College and Forsyth Dental Infirmary, which are here represented by Dr. Eugene Smith, Dr. Johnson, and myself, would heartily support any educational movement tending to release much of the postgraduate instruction in fundamentals of biology, physiology, pathology and the other subjects taught in these schools at present, which would give the postgraduate student more time to spend upon the research and clinical work in orthodontia and better fit him for his life work in orthodontia.

F. M. Casto, Cleveland.

On account of the lateness of the hour I do not wish to discuss the paper except to put my stamp of approval upon it, and to make a suggestion. In my investigation, I have found a great variance in the courses given to the undergraduates. A committee has been appointed by the American Society of Orthodontists to work upon this very proposition, and my suggestion is this: That the Committee on Courses and syllabi of this association be requested to invite the cooperation of the committee of the American Society of Orthodontists to work out a satisfactory course in orthodontia.

Dr. Johnson: Just a word in regard to that definition I gave. Dr. Smith's criticism is very pertinent—the definition is too long and I did not expect it would be final in any sense. It was given just to contrast it with the old and show that the thing is developing.

As to the medical education of the orthodontist, I cannot see any argument here. If dentistry is a part of medicine, orthodontia is also a part of medicine. Therefore the fundamental principles of medicine are absolutely essential, and while in orthodontia you can organize an ideal course outside the dental course, we have to develop the profession of dentistry. We have to work with the tools we have on hand, and one of the most effective ways to improve the undergraduate curriculum is to organize a course in orthodontia which is on a sound scientific basis.

DENTISTRY AND PUBLIC HEALTH WITH AN ACCOUNT OF THE FLINT DENTAL CLINIC.

By WILLIAM R. DAVIS, A. B., D. D. S.

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(Read before the Michigan Dental State Society, April 13th, 1920.)

NO EXCUSE is needed today for presenting on a dental program the subject of public health. Crown and bridge technic, root filling, every procedure in our practice today must face, in its final analysis, its effect upon the individual health and must stand or fall before that bar of judgment. For many years this was not so. True, an occasional voice was heard crying in the wilderness, but the Scribes and Pharisees turned not out to listen. Dentistry was looked upon as sort of tooth carpentry with the professional standing low in the scale and with a large question mark as to whether it was entitled to be called a profession at all, but should rather class as a trade. Its chief claims to consideration were either esthetic or masticatory and the relation to health was given scant consideration even by our medical confreres. Not so today. All at once the medical profession has awakened to the fact that there is something more in the mouth than the tongue and that infection there is no more to be ignored than elsewhere. Medical practice is becoming more scientific, and empirical treatment more and more giving way to cause, as well as effect. It is being realized that health and sickness are to be considered in the large, that all parts of the body are related, and that treatment of disease is a search for the cause of disease and the elimination of the cause or the rendering of it inert. It is also coming home that the big, important task today is the keeping of people well rather than curing them after they get sick—in other words, prevention.

In this renaissance, the teeth come in for close scrutiny and are found to be perhaps the greatest harborers of infection found in the body. Physicians are sending out their S. O. S. to the dentist and he is hastening to do his part in the rescue. Many conflicting voices are heard. Some are hastening to throw all the teeth overboard before finding out whether it is necessary to so lighten the ship in order to save it. Some think it is just a submarine scare head and that there is no danger at all—at least if you apply a little silver deposit to the leak. But out of it all is coming a newer and saner and larger field for dentistry. I believe no profession ever made the strides forward in so short a time that the dental profession has made in the past five years. For the most part, it is facing the great problems and responsibilities placed upon it with an open mind and a keen and honest endeavor to meet a very difficult situation. Witness the attendance at our city, state or national meetings and the discussions taking place both formally on the programs or informally in the hotel lobbies, or wherever dentists meet. Note the

support and work done by our research departments. Witness our splendid monuments to this awakening—Forsyth and Rochester Infirmaries. The preaching of oral hygiene pioneers like Ebersole, Fones, and others we might name, is bearing fruit today as anyone with eyes and ears open may observe.

Whatever may be the last word on devital teeth or the effects upon health of some areas found about the roots of non-vital teeth, there would seem to be no gainsaying the baneful effects upon health of mouth conditions as we find them today in the great mass of people. No one, not even the dentist, who has not looked into the mouths of thousands of school children, draft applicants or factory workers has any idea of the tremendous amount of decomposing filth and infections found in the mouths of these individuals. Not all the garbage heaps needing the attention of the sanitary officers are to be found in the back alleys. Some of the most offensive and injurious are to be found in the mouths of our school children and factory workers and some who are not factory workers or school children either. To say that if these were injurious the majority of our population would be sick is begging the question. There are many sick; many with lesions they will carry for life and which will shorten their lives, many below par; and many in their graves from diseases which were doubtless caused by these conditions, or in which these were a large contributing factor on the wrong side of the scales.

Does it mean nothing that thirty per cent of men at the best period of life are unfit for military service? Thoughtful, patient students, both medical and sociological, are trying to determine the causes of these defects. We know some of them—bad housing, improper working conditions, under-nourishment, venereal and other preventable diseases. All these causes are being studied and different organizations are trying to find out the best means of remedying them.

With preventable disease the dentist is called upon to do his share and it is no small one. Many diseases have been conquered and health authorities can apply the remedy. With others, a beginning has just been made and there are many ramifications to a complete solution. In this class are the large number of diseases in which focal infections and putrifactions in and about the teeth play a large role, the extent of which has not yet been fully determined. When children contract scarlet fever, measles or tuberculosis, we do not say these diseases are caused by bad mouth conditions; but who can say how much a mouth full of decaying debris and abscessed teeth had to do with the proper environment for the propagation of the germ causing the disease, or how much the lowered resistance these conditions cause contributed toward the contracting of the disease and the prognosis afterward? How much intestinal, ear and tonsil trouble of childhood is caused by these conditions? In adults, how much do they play a similar part in the diseases commonly attributed to focal infections, as well as any disease which may attack the individual? No dentist should fail to read the report of the Royal Commission on Dentistry with reference to conditions in Great Britain. This is one of the most illuminating reports ever published and is found on pages 527 to 605 of the June, 1919, Cosmos. In America, we are apt to think of mouth conditions as much better but our examinations of large bodies of children or adults show an appalling state of affairs nevertheless.

What shall we do to meet this situation and play our part in this great opportunity for service in disease prevention? Many suggestions are made,

but the problem is a complex one which we have to face. Do you realize that even in our United States there are not enough dentists, granting everyone competent and active, to properly care for twenty-five million people, whereas there are at least one hundred million who need dental attention? Some people think this problem of dentistry and health is simply one of educating the masses upon the need of dentistry. What are we going to do with this other seventy-five million when we get them educated? Already the education of the people is going faster than the ability of the dentists to do the job. Almost every dentist today is being pushed with more work than he can adequately accomplish and needs to cut down the number of patients he is trying to see rather than see more. Yes, we need education of the masses, but we need even more, right now, education of the profession and education of more dentists. A campaign is needed to present the advantages of the dental profession to worthy young men as a life work, offering an opportunity enticing enough for any man who is not afraid to work and who wants to serve his day and generation and whose rewards are reasonable if not as large as in some other and less important fields.

Some think the solution is to be found in the dental hygienist. She is needed and can render valuable service but she cannot solve this problem. She cannot remove infected teeth or roots or insert preventive fillings in pits and fissures. In one of our Flint kindergartens just one-half of these kiddies four and five years of age had from one to six abscessed teeth and ninety-eight per cent were on the road to that condition. In our entire school population last year below the High School, at least twenty-five per cent showed evidence of actual mouth infection and ninety per cent were on the way. Among our Boy Scouts, all of whom were examined separately, ninety per cent had cavities in their permanent teeth. How can a whole army of hygienists deal with these conditions? What we need are dentists to remove the infected teeth and roots of these children, and to put in preventive fillings; and hygienists to help cut down decay for the future.

All this shows that a proper solution will not be had for at least some generations to come, probably, but does it not place upon the dental profession a great obligation and opportunity? Shall we not buckle down to the task and work out plans which will do the maximum now and at the same time work toward the ideal to be accomplished? Shall we say because of the scarcity of dentists that the advantages of dentistry shall only be for a favored few who are educated and willing to pay the price and that the masses be damned? I am sure this is not the attitude of our profession and yet if we try to meet the situation alone by private practice this is about what it amounts to in the end. We shall be doing wonderful, intricate dentistry for the few and doing little to stop the necessity in the beginning for this intricate dentistry and not scratching even the surface of health service. Some beginnings are being made in industrial dentistry and school clinics. Some are making a good start and others are groping but I am satisfied the profession as a whole has not even begun to sense an adequate program for the task. Private practice cannot do it and neither can public or private charity. We must get a larger vision than any of these. In my judgment the only solution which can begin to apply with some degree of reasonable success here and now is an enlargement of a dental public health program beginning especially with the child.

Pediatricians tell us that the period from two to five or six years of age when the child enters school is the most neglected time in a child's life from a health standpoint, and yet one of the most important, because in these years conditions often develop which have a vital bearing upon all the future health of the child. Not one of the least of these is bad mouth conditions. One of the best known and most conservative pediatricians in the world recently said that [1]"Decay of the first teeth is in reality even more harmful than at a later age, for nutrition is more easily disturbed and its disturbance means more interference with the general development." (Yet some dentists today refuse to fill first teeth or extract abscessed ones). This shows we should begin before the school age, but as a public program the school child is the one we can reach now and in time through him and his parents we shall reach the earlier ones.

The public health dental clinic, in my judgment, should be under the public Department of Health rather than trying to work out its program separately, because it is surely one phase of public health work and gains by being thus associated. If we have not competent health departments with full time, alive health officers and competent nurses and assistants, then we should work for that end, helping educate the public to a public opinion which will demand such a department. Sometimes the dental start may have to be made first and work alone but the ideal is to be a part of the general health program as one of its important divisions.

Such a department should provide every facility for doing plastic fillings and extractions. It should have provision for general anesthesia when necessary and an X-Ray outfit for diagnostic purposes. A certain amount of diagnosis and removal of infection for adults would be necessary in cooperation with the other departments but the great effort should be placed upon the child, working thru the school, because here is a tremendous need which will tax every effort to even touch and which from a preventive standpoint, presents the greatest possibilities and it is simply waiting to be entered. I believe we should lay our greatest stress upon the younger grades, endeavoring to start with the child as soon as it enters school and remove infection when present. We should follow the child thru its school career and by examination at least once a year and preventive fillings we should endeavor to bring the child thru the grades without infection, lost or dead permanent teeth. This can best be done by extending out from our central department into the various school buildings as far as possible. I am thoroughly convinced after two years' experience in working on this problem that this is by far the most practical and economical plan for developing this great task. These conclusions have been forced upon me for the following reasons:

It will be many generations to come, if ever, when we will be able to persuade the mass of people to take their children periodically to the private dentist before the tooth aches or has a cavity large enough to see, and even in many of these cases it will be neglected as we know it is in the vast majority of cases today. In private practice the dentist is crowded with adult patients and the tendency is too great to neglect the child. We know from our school experience that too many of our children who do seek private care go to the quack who leaves undone the important work needed and does instead, that which is a menace to health rather than a disease prevention. Even with the dentists who are willing to properly

[1]Common Disorders and Diseases of Childhood. G. F. Still, page 200.

care for the child and with the parents who are educated to choose their dentist with discrimination and pay a reasonable fee for his services, this can only touch a limited few. All honor to our child specialists. Here is offered one of the most inviting fields in private practice today for any dentist who wishes to do the most worth-while job and he will make and hold a place for himself in keeping with the services rendered. But the task is too big to be solved that way.

In the schools when inspections are made and the nurse gives an appointment with the school dentist, very few parents are unwilling to have the work done. That has been one of the surprising things in our school clinic. Very few children dread to go and its popularity is growing every day with the children and the parents as well. You can get the children in the schools just as often as you want them, and they and their parents will permit the work to be done. It is simply a question of going after it. The difficult task is getting a start.

Another great reason why the work should be done as far as possible in the school building, is the economy of time of the dentist and also the child. With all the work done at a central clinic, even with the finest cooperation of the school nurses and teachers, the work is bound to bunch more or less and result in the dentists losing some time and in the children also being out of school to go a long distance to the clinic, sometimes having to wait a long time and occasionally losing out altogether and having to come another day. With the younger child it means that one of the parents or the school nurse must lose time to come with it, or an older child must stay out of school to do this. All these leaks in time can be saved when the work can be done in the school building, the child usually losing no time except that actually spent in the dental chair, and the dentist, putting in what are reasonable hours for such work, will accomplish more in a given time than he would otherwise do. To the central clinic would be sent those from schools near at hand and the cases needing general anesthesia or some special attention not practicable at the school office, but a very large percentage of the work could be handled right in the school building or a suitable place near it. The administration, of course, would head up in the central clinic at the health department. This, in my judgment, is the ideal toward which to aim and in which reasonable results can be attained, not in a far distant future, but now.

Does some one say it is not right to take money in taxes for this purpose or that the taxpayers will object? I do not think so. Most cities are proud of their schools and are awakening to the need of greater expenditures for better salaries and more enlarged programs. There was opposition at first to kindergartens, domestic science and manual training but today these are accepted as part of our school curriculum and provision made in all our newer buildings and most of the older ones for these departments as a matter of course—at least that is true in Flint and I think the time is near at hand when our school board, city council and taxpayers will take exactly the same view toward an adequate health program for the child. All they need is to be shown. You have to sell the proposition but you have such a wonderfully good article to sell. Compare it with the kindergarten which somebody sold to our keen men on the school board and to the taxpayers. I would not depreciate its value and yet in the final preparation of the child for life it plays the least part of any. A school health budget in our city today equal to the budget now spent yearly for equipment and maintenance of our kindergartens would enable the medical and

dental departments to do a very nearly 100 per cent job. If it is right to spend taxes for kindergartens, and I believe it is, who would dare say that it isn't right to spend it for health? I go further and say if it is right to spend money for free education isn't it right to spend public money for free clinics for our school children? What does education amount to without health? Doesn't health stand at the head? Isn't the care of the health of our children in reality a duty which we owe them just as we owe them the education?

Do you say this is pauperizing the child or his parents? Not if you teach them to look upon it as they look upon our free public schools. Don't charge five cents with the idea that you are giving professional services for that amount. Put it upon the same basis as our free public schools. Even tho you can not take all the children and urge those who can, to have the work done outside, you can leave the right attitude in the minds of the children and parents. Our forefathers believed it was good economy and the duty of the state to provide free education for the child. For the same reason and in the same way you can determine the attitude toward your public clinic and it need not be one of charity any more than the attitude of charity comes into our public schools.

Do you say this will interfere with the private practice of dentistry? On the other hand, I believe this will be the greatest boon to private practice it could possibly have, altho if that were its only reason it could not stand at the bar and plead its cause for public support. As an educational program alone its value is beyond compare. The parents become educated to the need of dentistry from a health standpoint thru these school clinics for their children, and hundreds who never had dental services are seeking it. Bring the child thru the grades with the education of frequent examinations and dental care and he is going to continue this program when he leaves school. Believe me when I say that this program will create a demand for dentistry much faster than we can educate the dentists to do the job.

I also believe this program will go further toward solving the quack problem than any other yet undertaken. The children and their mothers are learning the difference and I question if the charlatan will be able to withstand the education on this subject which is bound to come in the next few years. The school dentist has a chance to educate and he has no axe to grind. The time is rapidly coming when the line is going to be more sharply drawn between competent service and quackery, and I mean by that the so-called ethical quack, as well as his advertising confrere.

In these public health clinics the aim should be the elimination and prevention of infection. This is a distinctive health feature. Whatever the last word on devitalization, the need is too great in the public health clinic to spend time on a debatable procedure. Why treat one tooth when, with the same amount of time, ten could be prevented from coming to the necessity of treatment and the ten are all there waiting for the prevention?

School examinations should all be made with mouth mirror and probe by a dentist or one dentally trained. Only in that way can you detect the tiny pit and fissure defects in time for salvation. The importance of this is driven home on the writer more and more every day. Such examinations can be made both sanitary and expeditious.

As an evidence that such a program is feasable, let me say a word briefly about what we are doing in Flint. Three years ago Flint did not have a full-time health officer. Two years ago it had one full-time physician and one city and one school nurse and a part-time dentist

who saw, in his private office, patients referred by the school nurse. In the fall of 1918 it added another full-time physician and the writer entered upon the duties of full-time dentist with the health department to work out a dental program. Provision for these two additions was accomplished by the efforts of our health officer and mayor who were convinced of the need, the Mayor, Charles S. Mott, putting his salary of $2500 a year back into the treasury to add a sufficient budget. We had a second-hand outfit in a most uninviting part of the basement of the City Hall. A comparison with his former environment was not indulged in by the city dentist. He had to look forward and not backward for a vision. However, he was not oblivious to the many complimentary or otherwise remarks passed upon his judgment.

We endeavored that first year to make, as far as possible, a complete survey of mouth conditions among our school children in the grades, examining nearly ten thousand in all. In addition, we did all the actual clinic work possible and gave some educational talks to mothers, clubs, etc. We had splendid cooperation and support from our health department, teachers and school nurses; and in six months' time sufficient showing of the need and possibilities had been made, that the City Council and School Board made provision in the new budget to materially enlarge our work. Consequently on September 1st, last, we added to our full-time dental force two excellent young men, recent graduates of the U. of M. Dental Department and a competent hygienist, a graduate of the Rochester Infirmary. Provision was also made for a pediatrician to give entire time to babies and school children, and for twelve city and school nurses. The city also purchased a building adjacent to the City Hall and remodeled it for the use of the entire Health Department, where we now have comfortable rooms and modern new equipment. We also have made a start in branching out into the school or near it.[2]

We make an examination with mouth mirror and probe of all children in the grades once a year and notices are sent to all parents of children needing dental attention. On the back of this notice is an application blank for work to be done at the city clinic if desired. There is provision on the examination card for a six years' record and, after data is taken off and notices sent, this card is filed with the teacher of that child along with the physician's record and follows the child thruout its school career. The teacher and nurse here have a yearly physical record of the child for their inspection and follow-up work as desired. We believe this to be one of the most practical features of this system. The cooperation of teachers and nurses has been well nigh perfect. Without that we could do little. But they are enthusiastic over the results and the pupils are catching the fever and begging to be allowed to come to the school dentists. We keep uppermost all the time the pain the dentist saves. Ladies and gentlemen, too long we dentists have allowed ourselves to be the goat in that old saw about pain. If given a chance, for every moment of possible pain the dentist may save hours and days of later pain, anguish and sickness; and the public can be taught that attitude just as well as the other. Don't fool the children, tell them the truth, play fair and they will meet you half way and you can do the necessary extractions and fillings for almost everyone. It will be interesting to know that the first 100 per cent dental room in our city schools was attained in the 4th grade in the foreign section where mouth conditions were fearful and practically untouched by private dentistry. These children are

[2]Since this was written the city budget for the following year has been passed and provides funds for two more full-time dentists, making five in all for 1920-21.

as proud as Lucifer of their pennant, which their nurse gave them, showing their attainment, and you would be surprised at the clean, alert, comfortable aspect of the faces in that room.

We have just made a beginning on the great task needing to be done, but we have hopes that it is just a beginning of what will ultimately be accomplished. The writer does not offer it as a last word on a public health dental program, but invites suggestions and criticisms looking toward the coordination of all our efforts into the most desirable program possible.

May I take this opportunity to urge more consideration of this field of dentistry upon the members of our profession. True, the opportunity and remuneration in private practice was never so inviting as today. It has its satisfactions and rewards and the conscientious practitioner is deserving of the increased regard for his services and the better fees which are coming his way. The public health dentist may never be as amply rewarded financially as is the private practitioner, altho, I believe, there is a growing appreciation of public service and a willingness to pay more adequate salaries to men of ability and vision. Certainly the opportunity for a worthwhile piece of service is inviting to any one with ideals and the satisfaction of having this part in the large program for saving pain, disease prevention, and a better race is a great one. We need full-time men of experience in this public health service. It is a man's job and worthy the best undivided effort that can be put into it.

Before closing I wish to bear testimony to the cordial, whole-hearted support which has been given to me in this work by the Flint Dental Society. It does not seem that anyone in my position could have more congenial brother dentists and receive from them a better backing. This has been a great inspiration and of inestimable value. As an evidence of this support I conclude with a resolution recently adopted unanimously by our Society:

"The Genesee County Dental Society of Flint, Michigan, is keenly aware of the relation of the dental profession today to public health problems because of the great prevalence of mouth infections which are believed to cause or contribute toward many bodily ills. Clinical evidence in hospitals and private practice, studies in our research departments, conditions brought to light by school and draft board examinations all force this problem home. Our medical confreres are calling upon us for the elimination of mouth infection as the next great step in preventive medicine.

To meet this challenge the dental profession is faced with the great number needing their professional services and the small number in the profession to do the task. In our entire United States there are not enough dentists to properly take care of one-fourth of the people who need dental attention.

It must further face the great amount of time required to give competent dental service in comparison with other surgical or medical care, raising a problem of an impossible expense for many people and the handicap to private dentists in rendering free service to the needy.

The society further realizes that this problem of dental public health cannot be solved except it start with the child at least as soon as its first teeth are erupted and may often need to go back to the parents before the child is born.

All this makes it evident that an ideal solution cannot be reached for generations to come, if ever, but much can be done now, and to strive for the ideal is a worthy pursuit of any profession or individual. The responsibility and opportunity given to the dentists in this great problem of public health is one which gives a challenge worthy the steel of any yoeman.

Therefore, be it resolved that we, the

members of the Genesee County Dental Society agree to take every opportunity to instruct those coming under our care concerning this problem, and especially parents with reference to the need of beginning the care of the teeth of their children at 2½ or 3 years of age, as soon as erupted, as the only means of preventing serious mouth infection.

That we agree to give all children coming under our care competent and conscientious attention, or if unable to give the time to do this, to refer these children to one whom we believe can.

That we further endorse the start made by the Dental Division of the Health Department of the City of Flint, in endeavoring to meet this situation by free dental clinics and recommend that our Common Council and School Board extend this work as rapidly as sound policy will permit in the direction of providing this department facilities for simple dental operations in each school building, where most of the work needed can be done with the greatest economy of the dentist's time and with the least interference with the school time of the child.

We further endorse, as the aim of this department, that it endeavor to have all infection removed and preventive polishing and filling performed for as many children as possible, making the greatest effort first in the lower grades and endeavoring eventually, as the department grows, to bring all our children to the end of their grammer grades without infection, dead or lost teeth.

We recommend that this department should urge, upon those who can afford it, the advantage of competent private care with its more frequent examinations and attention to matters of perfection which are not practical in the public dental clinic; but we believe that no child should be denied the invaluable service of the removal of infection and preventive filling, or polishing, because the parents cannot or will not provide for the same elsewhere. Surely every child is as much entitled to health as to education."

A METHOD FOR PREPARING BACTERIOLOGIC MEDIA CONTAINING ASCITES FLUID.

By LINWOOD G. GRACE, D. D. S., Cleveland, Ohio.

(From the Laboratories of the Research Institute of the National Dental Association, Cleveland, Ohio.)

THE use of broth to which certain amounts of ascites fluid are added has been advocated for some time for cultivating streptococci and other organisms. The usual directions given for its preparation are that the sterile fluid be added to the broth which has been previously made and sterilized. The method requires most careful attention to details and offers numerous sources for contamination. If the fluid has not been collected aseptically, it can, of course, be sterilized by passing thru an unglazed porcelain filter. There still

remains, however, the problem of getting it into tubes of broth in definite quantities without contamination. H. Bierry (Comptes Rendus des Seames de la Société de Biologie, 1916, No. 7, p. 270) called attention to the fact that ascites and other albuminous fluids may be autoclaved at 112° C. without coagulating, if previously rendered alkaline. It may then be neutralized and reautoclaved and still remain clear. Or it may be added to broth or agar, the reaction of which is adjusted as required, and autoclaved without causing coagulation or precipitation in the media.

It is quite obvious that such a process infinitely simplifies the preparation of such a media. The ascites can be added to the broth or agar in definite amounts before it is tubed. This is far more accurate than adding it to the media after it has been tubed and also less laborious.

In order to determine the minimum amount of alkali necessary to add to ascites fluid to prevent coagulation when autoclaved, we carried out the following experiment:

The sample of ascites on hand was nearly neutral. Phenolphthalein was used as the indicator. Twenty test tubes were selected and into each test tube were placed 10 c.c. of ascites fluid. Definite amounts of alkali were added to each tube and all autoclaved at 15 pounds pressure, 118° C., for 15 minutes. This is slightly higher than the temperature suggested by Bierry, but is the standard we have used for some time for autoclaving media. After autoclaving, all those which were still liquid were filtered. A separate tube in which no alkali was added was run as a control. As a final test a few drops of a normal acid solution were added to each tube. A flocculent precipitate was thrown down in each case upon the addition of the first drop of acid.

From the results of the experiment it would appear that six or seven drops of 40 per cent NaOH to each 10 c.c. of ascites, or about 2½ per cent alkali, gave the best results. However, before adding the alkali, the ascites should be titrated, as a more acid fluid would undoubtedly need a greater amount of alkali to produce the same results. It is better to add small quantities of a strong alkali than large quantities of a weak one on account of diluting the fluid.

When the ascites is received it is rendered alkaline by adding 2½ per cent of 40 per cent NaOH, autoclaved 15 pounds at 118° C. for 15 minutes and stored in the ice box until ready for use. When the media is made up this ascites is added in the required amounts, usually 5 per cent, the reaction of the entire batch adjusted, filtered, tubed, and autoclaved 15 pounds at 118° C. for 15 minutes. We have been using this method for over a year, and results have shown that all organisms tested grow equally as well as in media prepared by the old method.

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FOCAL INFECTION IN THE ETIOLOGY OF SKIN DISEASE.

By H. J. F. WALLHAUSER, M. D., Newark, N. J.

(Read at April 1920 Meeting of New Jersey Research Society.)

WHILE systemic disease due to localized infection was always conceded even before the development of bacteriology, the work of Billings and Rosenau together with their team of co-workers has wonderfully developed a part of medicine which today is occupying a most important field in the application of their theories to many ailments of previously doubtful etiology.

Until the report of their work appeared, pus infections occupied a rather limited scope, being associated mainly with surgical and obstetrical conditions. The field has now extended to every department of medicine. In dermatology, while a relationship between certain dermatoses and infections of internal origin had already been established in a few conditions, a new stimulus has since been added and every skin affection of an inflammatory character is being studied etiologically; while it is too early to make any positive deductions, we have at least succeeded in a few instances in adding to the list of conditions as of possible origin from focal infections.

Among recent writers the findings of Ravitch and Steinberg with regard to the relation of certain dermatoses to focal infection is interesting. They studied several cases of toxic erythema in which small hemorrhagic lesions occurred in cases of generalized joint, heart and kidney infection and found histologically that the skin lesions consisted of small abscesses, from infection of the small capillaries with cocci, the endothelium was damaged and the surrounding tissue was infiltrated with red blood corpuscles and round cells, in some locations necrotic areas were present.

The lesions retrogressed during favorable progress of the case and fresh crops occurred during relapses. While they do not claim that the skin manifestations measured the intensity of the case, as they found the dermatosis mild or absent in some severe cases and intense in mild ones, these findings are extremely interesting as providing conclusive proof of the possibility of extension of pus infections to the skin surface and which is manifested by various lesions not macroscopically pustular.

In erythema nodosum, the findings agreed with previous knowledge that this condition usually occurs in individuals giving a history of previous attacks of rheumatism. In several cases of erythema iris they found a focal infection while in others it could not be demonstrated; yet the skin lesions were the same, whether of infectious origin or otherwise.

In the various forms of urticaria a majority of cases failed to show infection. This was to be expected as urticaria has been experimentally proven and clinically demonstrated as an anaphylactic reaction, and therefore, could be considered under the head of focal infection only after other known causes of anaphylaxis, i. e., foods, drugs, etc. have been eliminated. In cases of long

standing which have resisted treatment, focal infection should be sought. One such case under personal observation which continued in spite of all measures adopted, promptly responded on the removal of two infected teeth. Cases of purpura hemorrhagica were classified similarly; they found some the result of focal infection, others were due to anaphylaxis, and in some cases no cause could be assigned.

In herpes zoster which had already been established as the result of an infection in the posterior root ganglion of the spinal cord; cocci having been isolated and the skin condition reproduced by injection into the blood stream experimentally. They found only a few in which focal infection could be demonstrated.

In eczema on account of the widely varying etiology, while they admitted the possibility of adding focal infection as an etiological factor, which was demonstrated by a case of eczema in which toxic reaction in the skin was apparently due to an ulcerated appendix, yet they were inclined to other causes as mainly responsible for this condition.

Eczema should not be regarded as a clinical entity—it is nothing more or less than an inflammatory reaction in the skin which may be due to any cause of an irritating character, whether of local or internal origin; focal infection will therefore account for some of the cases of this condition. In this class we can place those cases resulting from acrid discharges from mucous membranes, i. e. about the eyes from infectious conjunctivitis, on the upper lip from sycosis nares, on the legs from ulcerations and injuries followed by secondary infection. One of the most trying cases of generalized eczema that has come under personal observation resulted from an inflammed hemorrhoid in which the skin surface became universally involved accompanied by an acute cardio-vascular disease, presenting all the symptoms of a profound toxemia and in which complete and uninterrupted convalescence followed after the hemorrhoid was opened and freely drained.

At the meeting of the American Dermatological Association, 1917, Chipman presented a report of the study of fifty unselected cases of dermatoses and suggested a grouping of cases as follows, under class one, cases due to rheumatic causes; class two, cases at present considered of nervous origin; class three, the tuberculides resulting from foci of tuberculosis; class four, coccic affections, such as impetigo, eczematoid dermatitis, which originate from some latent focus within the skin itself; class five, conditions at present accepted as anaphylactic; class six, an uncertain groupe, which may possibly be due to focal infection, provisionally at least.

This would seem a step forward and it will be interesting to note a few deductions regarding this feature.

In groupe one, erythema nodosum and erythema multiformi were considered as so frequently associated with the rheumatic state as to be accepted as a symptom complex of this condition.

Under nervous types of skin reactions, were placed lesions of a circumscribed character, i. e. lichen simplex chronica, herpes zoster and herpes febrilis, vitiligo and circumscribed scleroderma, alopecia areata was likewise considered under this head.

Under the tuberculous group the various tuberculides had already been traced to focal infection, and the coccic group were regarded as possible of spreading from latent foci, i. e. eczematoid dermatitis.

Under conditions due to anaphylaxis were grouped eczema, urticaria with its variations and erythema multiformi.

Under provisional conditions in which focal infections may possibly play a part were placed rosacea granuloma annulare — chilblains and Reynaud's disease. In the latter thyroid disease was frequently found and the possibility

of infectious thyroiditis was considered as a contributory factor in the etiology.

In their study of the locations involved it is remarkable to note that in fifty cases examined thirty-five presented the infection in the teeth alone, four in the teeth and tonsils, one in the teeth and appendix, while in the remaining ten cases the infection was found in the appendix in three, tonsils four, lymph nodes one, accessory sinuses, one, and in one no infection could be found.

These findings are certainly suggestive and call attention to the teeth as the most commonly affected locations observed. A most interesting discussion followed and for our benefit it will be interesting to briefly consider some of the principal features. Dr. Sutton stated that he had examined one hundred cases of skin affections for focal infections. In twenty-five per cent he had been unable to trace any relation, while in seventy-five per cent the cases were rapidly improved or cured after finding the focus of infection and its removal.

Many interesting case reports followed. Dr. Engman cited the case of a man who had a superficial gangrene of the fingers and spots on the penis with Reynaud's phenomena of both hands and feet. This condition had continued uninterruptedly for a period of nine years. He was then studied from the standpoint of focal infection and it was found that he had a very decided pyorrhea with abscess pockets in several alveolar processes. Immediately following extraction of the infected teeth and aseptic treatment of the gums, his objective and subjective symptoms rapidly disappeared.

Dr. Morrow reported a case of eczema of the face and neck, which had resisted treatment for many years, the skin was thickened and inelastic and the patient suffered greatly from violent pruritus. Radiographs showed multiple dental abscesses. Following extraction the eruption rapidly improved and at the end of three weeks the patient had entirely recovered.

Dr. Highman reported the case of a man in which a diagnosis of the fatal variety of dermatitis exfoliative was made, the case being considered hopeless. As a last resort, his mouth which was in bad condition, was cleaned up by extraction, and treatment for pyorrhea. In two weeks the patient was well, and at the end of three years was still in good physical condition.

Many other cases of a like interesting nature were mentioned, but the above were the most striking examples of rapid recovery on the removal of the cause.

During the past two years all cases of doubtful etiological origin that came under personal observation have been investigated for possible foci of infection and not without reward.

A brief description of a few cases will be of interest. Case 1. Female, aged 32 had developed an eruption over the bridge of the nose, extending out over the cheeks, forming thus a butterfly-like configuration; the eruption had been persistent with exacerbations in intensity for about one year. The color was a deep purplish red with mild superficial sealing, a diagnosis of lupus erythematoides was made mainly on account of the butterfly-like configuration and persistent character of the eruption. This diagnosis was not justified, however, as no scarring was present, which is so characteristic of lupus erythematoides. The diagnosis of toxic erythema was suggested and on account of the varying temperature which ranged from 99° to 104° an abscess was suspected. Physical examination of the lungs and heart was negative. The blood showed a mild lymphocytosis. The urine was negative for casts, but showed a faint trace of albumen. Examination of tonsils, teeth, appendix and internal organs was negative. All plans of treatment proved ineffective and the patient gradually passed into a state of coma and died. The post mortem findings revealed an abscess of the liver, which had been impossible to diagnose. An

exploratory operation in this case, however, would most likely have resulted favorably.

Case 2. Male, aged 3, presented a lesion almost identical with the case above described, involving the bridge of the nose and cheeks; it consisted of a pale slightly scaly red eruption, with abrupt raised borders. The onset had been sudden and had appeared about a week previously and had remained practically unchanged. On account of the experience with the previous case a focal infection was sought. Examination revealed a tenderness over the right iliac region, with an elevation of temperature. Immediate operation was advised and resulted in finding a pus appendix which had already ruptured. Notwithstanding, the patient made a good recovery. The eruption disappeared on the third day following operation and has not since recurred.

Case 3. Male, aged 43, presented an eruption of purpura hemorrhagica, involving the lower extremities, which had recurred at varying intervals during a period of two years, the eruption being generally accompanied by rheumatic pains in the joints of his fingers, knees and ankles. Inspection of his mouth showed several decayed teeth and a decided pyorrhea. Treatment for the latter was instituted and the affected teeth extracted. Sodium salicylate was given in ten-grain doses, three times a day. At the end of four weeks the eruption had disappeared and the joint pains while still present, were rapidly becoming less painful and the patient was greatly benefited in his general condition.

Case 4. Female, age 46, presented an inflammatory eruption involving the face, chest, abdomen, back and thighs. The eruption varied in different localities; in the face it consisted of a uniform erythematous dermatitis with a peculiar pink, yellowish cast. The palms were involved in a dermatitis which was sharply limited to this region, the eruption being entirely absent on the backs of the hands and fingers. The eruption in this location was also uniform but more scaly in character. On the neck, chest, and thighs, the eruption consisted of pin head sized pinkish papules with scaly surfaces, which, in some locations, had coalesced to form scaly patches.

Previous history showed that these attacks of dermatitis had occurred at varying intervals of several years. The first attack had occurred at the age of 18 and followed the extraction of "an ulcerated eye tooth." The mucous membrane of the mouth at this time was covered with a "diphtheria"-like exudate, the skin eruption had developed quite suddenly about one week following extraction. After several months the eruption gradually disappeared; following this the patient had had five attacks, each one being preceded or accompanied by an "ulcerated tooth."

Physical examination of viscera was negative.

Urine showed a decided increase in acidity, but was otherwise negative. The subjective symptoms consisted of a feeling of malaise, patient tired easily and especially after mental effort frequently complained of a feeling of dizziness and dull headache, otherwise she was in good physical condition and well nourished.

Examination of mouth showed an inflammatory condition of the gums, they were swollen and red, the teeth were loosened and pus could be pressed out between the mucous membrane and teeth in several areas.

Extraction was advised and apical abscesses were found present on every tooth of the upper jaw, the pus just spurted out on the removal of each tooth. Two weeks following extraction patient noted a marked improvement in her general condition, was able to do her work without tiring and her mental condition which had become dulled and "hazy" had cleared. The eruption while still present had not increased and was gradually disappearing. In a few loca-

tions the skin had already become normal; this was especially noticeable in the palms of the hands which previously had caused considerable discomfort and had now entirely cleared up. This patient is still under observation and a final report will be submitted at some future time.

Aside from these cases many others have been encountered, that were benefited or cured. In this category could be mentioned many cases of eczema occurring in rheumatic individuals, also cases of secondary dermatitis from infections from the nose as occurs from sycosis nares, elephantiasis of the face from a streptococcic infection involving the nose and mouth, and others of a similar character.

The results in the cases above reported would certainly point to a conclusive decision regarding focal infection in the conditions mentioned, yet we cannot accept this question as finally settled, for we are confronted by the well-known fact that various causes may produce the same clinical picture and this is especially so in dermatology. We can, however, accept this theory conclusively as another added known cause to be sought for as a routine measure, in acute or subacute inflammatory conditions of doubtful etiology. From this standpoint the subject has become increasingly interesting. We must, however, be careful not to be carried away by too readily accepting this cause in every case in which it appears likely. Let us, rather, continue guardedly cautious, remembering that we are only in the very early stage of the study of focal infection. In other words, we should not accept it as the cause in every obscure case, even if foci of pus are found present, i. e., lichen planus has been included, yet cases of this condition have occurred so frequently following nervous shock that a nervous cause has been commonly accepted, and the finding of abscesses in several cases should not be sufficient to eliminate our former deductions until further substantiated: and this may be said of many other conditions at present being included.

That we have been greatly benefited in a field of former uncertainty is beyond question. I doubt if anyone who has given the subject any thought whatever could be found to the contrary. The harmful effects that have resulted from our efforts to save teeth can not be underestimated; yet again we must, in this case, proceed with caution and all means of control should be employed before extraction. We must remember also that this source may be secondary to other conditions, from which the patient has become debilitated and in which the teeth and mouth infection has become intensified and is acting only as a contributory factor in the general infection. In other words, focal infections are not limited to the teeth and mouth, we must bear in mind that it may be a tonsilar or peritonsilar abscess, chronic sinusitis. In the abdomen a cholecystitis, appendicitis, submucous abscess, salpingitis, vesiculitis seminalis, prostititis orlymph nodes. Various local forms of infection must also be included such as conjunctivitis and infections from nasal mucosa and pus foci in the skin itself.

It has surely become our duty in every case of acute or chronic dermatosis to investigate carefully its possible relation to foci of infection, we can not conscientiously overlook the importance of these sources in the possible etiology of our cases, as enough evidence is present to warrant the statement that focal infections are responsible for a large percentage of our cases of acute and subacute inflammatory skin affections.

REPORT OF THE TABULATION COMMITTEE OF NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

Mr. President and Members of the National Association of Dental Examiners:

Your Tabulation Committee presents herewith its tenth annual report as follows:

Since the meeting of the Association held in New Orleans, we have completed the tabulation of the State Board Secretaries' reports of the first examinations for the year 1919. Dr. H. E. Friesell, Chairman of the Tabulation Committee for the N. A. D. E., has also tabulated the reports.

We have had a conference and compared results; the reports are identical, and we feel sure that they are accurate. Having received the audit of Dr. Friesell and myself the report is declared official.

Reports were received and tabulated from forty-seven (47) State Board Secretaries, which is the largest number received any one year during the ten years of tabulation. Only two are missing. I hope to have reports from every state in the union for 1920.

The State Board reports for 1919 were as a whole very satisfactory; yet there were several that might be greatly improved. If each secretary, in making out his report would follow carefully the directions on the back of the tabulation blanks, the work of your committee would be greatly simplified. Also let me urge you again to send in your reports as soon as your examinations are completed. If at any time your blanks are exhausted, please notify us and a supply will be sent.

The total number of graduates from the dental schools of the United States for the year 1919 was 3587, an increase of 242 over 1918—(not enough). Of this number 3149 were examined by the 47 State Boards reporting; number passed 2672; number failed 477; percentage of failures 1919, 15.1.

The total number of graduates for the ten years of tabulation was 25054; total examined during the same period 20501; passed 17401; failed 3100; percentage of failures, 15.1.

Only three schools had 30 per cent or more failures for 1919, namely: New York College of Dentistry, 31 per cent; Cincinnati College of Dental Surgery, 60 per cent; Univ. of Pa. School of Dentistry, 31.2 per cent.

So far as I can learn there has been no change during the past year in the number of institutions actively engaged in the teaching of dentistry in the country, the number being 46, although I am informed that the number may be reduced during 1920.

My report has been greatly delayed this year on account of the difficulty of getting supplemental information from the colleges, which it was absolutely necessary to have before completing the report.

The proceeding could have been published two or three months earlier if my report had been ready.

Your committee wish to personally thank each State Board Secretary for sending a 1919 report and for the many courtesies received during the year. We append herewith report of 1919 tabulation; also cumulative tabulation for the years 1910-1919 inclusive.

Respectfully submitted,

T. A. BROADBENT,
Chairman Tabulation Committee
for N. A. D. E.

RESULT OF TABULATION OF STATE BOARD REPORTS FOR GRADUATES YEAR 1919.

State	College	Total Number of Graduates	Total Number Examined	Examined Passed	Examined Failed	Percentage of Failures	Number of States Examined in
California	Univ. California College of Dentistry	62	58	58	....	....	1
	College P. & S. Dental Dept.	57	55	42	13	23.6	2
	Univ. of So. Cal. College of Dent.	82	56	54	2	3.5	3
Colorado	Colorado College Dental Surgery	51	40	36	4	10.	5
Dist. Columbia	Howard Univ. Dental Department	1	....	....	....	....	....
	Georgetown Univ. Dental Dept.	21	8	6	2	25.	3
	Geo. Washington Univ. Dept. of Dent.	23	18	15	3	16.6	7
Georgia	Atlanta-Southern Dental College	129	128	119	9	7.	3
Illinois	Chicago College Dental Surgery	235	182	165	17	9.3	12
	Northwestern Univ. Dental School	139	129	111	18	13.9	14
	Univ. Illinois College of Dentistry	64	60	54	6	10.	10
Indiana	Indiana Dental College	91	83	75	8	9.6	6
Iowa	University Iowa College of Dentistry	115	90	89	1	1.1	6
Kentucky	Louisville College of Dentistry	74	70	64	6	8.5	15
Louisiana	Loyola University School of Dent.	16	14	14	....	....	1
	Tulane University College of Dent.	34	26	25	1	3.8	6
Maryland	Baltimore College Dental Surgery	66	53	48	5	9.4	7
	University of Maryland Dental Dept.	89	78	56	22	28.2	12
Massachusetts	Tufts College Dental School	154	139	109	30	21.5	5
	Harvard University Dental School	67	49	41	8	16.3	6
Michigan	Univ. Michigan College Dent. Surgery	86	79	79	....	....	2
Minnesota	University Minnesota Col. of Dent.	58	53	52	1	1.8	2
Missouri	Kansas City Dental College	89	86	77	9	10.4	5
	Washington University Dental Dept.	51	49	47	2	4.	3
	Western Dental College	77	71	57	14	19.7	9
	St. Louis Dental College	80	66	58	8	12.1	14
Nebraska	Univ. of Nebraska College of Dent.	37	37	36	1	2.7	3
	Creighton University College Dent.	49	47	44	3	6.3	6
New York	New York College of Dentistry	229	206	142	64	31.	2
	University Buffalo College of Dent.	101	97	79	18	18.5	1
	College Dent. & Oral Surg., New York	204	195	141	54	27.6	2
Ohio	Ohio College Dental Surgery	58	50	38	12	24.	5
	W. Reserve Univ. School of Dent.	48	46	35	11	23.9	1
	Cincinnati College Dental Surgery	9	5	2	3	60.	2
	Ohio State Univ. Col. of Dentistry	17	16	13	3	18.7	1
Oregon	No. Pacific College of Dentistry	105	83	66	17	20.4	5
Pennsylvania	Philadelphia Dental College	47	39	33	6	15.3	4
	Univ. of Pittsburgh School of Dent.	95	94	93	1	1.	2
	Univ. Pennsylvania School of Dent.	250	208	143	65	31.2	11
Tennessee	Vanderbilt Univ. School of Dent.	43	41	36	5	12.2	9
	Univ. Tennessee College of Dentistry	22	19	17	2	10.5	5
	Meharry Dental College	46	26	20	6	23.	11
	Univ. W. Tenn. Col. Dent. Surgery	4	3	3	....	....	1
Texas	State Dental College	47	39	36	3	7.7	2
	Texas Dental College	4	4	3	1	25.	1
Virginia	Med. Col. of Virginia, Dental Dept.	35	34	33	1	2.9	3
Wisconsin	Marquette Univ. Dental School	126	120	108	12	10.	6
		3587	3149	2672	477	15.1	

SUMMARY.

Number of State Board Reports Received	47
Number of State Board Reports Tabulated	47
Total Number of Applicants Examined and Passed	2672
Total Number of Applicants Examined and Failed	477
Percentage of Failures	15.1

CUMULATIVE RESULTS OF TABULATING STATE BOARD REPORTS FOR GRADUATES, YEARS 1910 TO 1919, INCLUSIVE.

State	College	Total Number of Graduates	Total Number Examined	Examined Passed	Examined Failed	Percentage of Failures	Number of States Examined in
Alabama	Birmingham Dental College	54	50	38	12	24.	1
California	University California College of Dent	275	101	101	....	.....	2
	Col. P. & S. Dental Dept	371	112	96	16	14.3	4
	Univ. So. California College of Dent	453	150	142	8	5.3	8
Colorado	Colorado College Dental Surgery	367	340	316	24	7.	13
Dist. Columbia	Howard University, Dental Dept	266	102	78	24	23.5	22
	Georgetown University Dental Dept	272	195	152	43	22.	24
	Geo. Washington Univ., Dept. of Dent	159	113	93	20	17.7	11
Georgia	Atlanta-Southern Dental College	245	244	233	11	4.5	4
	Southern Dental College	362	337	303	34	10.	10
	Atlanta Dental College	472	441	367	74	16.7	15
	So. Eastern Dental University	2	2	....	2	100.	2
Illinois	Chicago College Dental Surgery	1388	1159	950	209	18.	28
	Northwestern Univ. Dental School	1411	1142	983	159	13.9	34
	University Illinois College of Dent	334	306	268	38	12.4	19
Indiana	Indiana Dental College	582	553	501	52	9.4	17
Iowa	University of Iowa College of Dent	608	553	523	30	5.4	13
	Drake University College of Dent	32	29	29	....	.....	1
Kentucky	Louisville College of Dentistry	482	422	374	48	11.3	28
Louisiana	Louisiana State College Dent. Surg	6	.....	.....	....	.....	....
	Loyola University School of Dent	41	35	35	....	.....	2
	Tulane University College of Dentistry	204	155	142	13	8.3	7
Maryland	Baltimore College Dental Surgery	586	416	311	105	25.2	20
	University Maryland Dental Dept	592	469	345	124	26.4	22
	Baltimore Med. Col. Dental Dept	83	64	43	21	32.8	12
Massachusetts	Tufts College Dental School	945	799	724	75	9.3	6
	Harvard University Dental School	458	359	315	44	12.2	9
Michigan	Univ. Michigan Col. Dental Surg	794	710	692	18	2.5	16
Minnesota	University Minnesota College Dent	669	622	586	36	5.7	7
Missouri	Kansas City Dental College	514	470	434	36	7.6	14
	Washington University Dental Dept	338	319	308	11	3.4	11
	Western Dental College	456	411	365	46	11.1	18
	St. Louis Dental College	562	507	473	34	6.7	21
	National Univ. Arts and Sciences, Barnes School of Dentistry	82	70	55	15	21.4	5
Nebraska	Univ. of Nebraska College of Dent	191	184	183	1	.5	3
	Creighton Univ. College of Dent	262	251	243	8	3.1	7
New Jersey	College of Jersey City, Dent. Dept	57	53	7	46	86.8	1
New York	New York College of Dentistry	1509	1305	946	359	27.5	5
	Univ. Buffalo, College of Dentistry	509	470	353	117	24.8	4
	College Dent. & Oral Surg., New York	944	859	615	244	28.4	4
Ohio	Ohio College Dental Surgery	417	351	263	88	25.	19
	W. Reserve Univ. School of Dent	350	324	251	73	22.2	4
	Cincinnati College Dental Surgery	141	114	75	39	34.2	9
	Ohio State Univ. College of Dent	374	355	322	33	9.3	7
Oregon	No. Pacific College of Dentistry	654	474	395	79	16.6	10
Pennsylvania	Philadelphia Dental College	510	363	277	86	23.7	18
	Univ. Pittsburgh School of Dent	606	579	558	21	3.6	8
	Univ. Pennsylvania School of Dent	1795	1227	982	245	19.9	25
	Med.-Chi. College Dental Dept	348	248	176	72	29.	9
Tennessee	Vanderbilt Univ. School of Dent	379	351	330	21	5.9	18
	Univ. Tennessee College of Dentistry	128	118	112	6	5.	7
	University Memphis, Dental Dept	5	4	4	....	.....	3
	Meharry Dental College	281	224	163	61	27.2	22
	Univ. W. Tennessee Col. Dent. Surg	15	8	8	....	.....	3
Texas	State Dental College	242	164	136	28	17.	6
	Texas Dental College	109	80	62	18	22.5	1
Virginia	Univ. Col. Med., Dental Dept	32	30	23	7	23.3	2
	Med. Col. of Virginia, Dental Dept	143	134	116	18	13.4	6
Wisconsin	Marquette University Dental School	571	457	411	46	10.	9
	Wisconsin College P. & S	17	17	15	2	11.7	1
		25054	20501	17401	3100	15.1	

SUMMARY.

Total Number of Applicants Examined and Passed	17,401
Total Number of Applicants Examined and Failed	3,100
Percentage of Failures	15.1

T. A. BROADBENT, Chairman Tabulation Committee for the N. A. D. E.

THE JOURNAL of the NATIONAL DENTAL ASSOCIATION

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VOL. 7 NOVEMBER, 1920 No. 11

Editorial Department.

THE DENTAL AND MEDICAL PROFESSIONS WILL REPENT IN SACKCLOTH AND ASHES.

Some time ago *The Journal* voiced itself strongly on the subject of wanton extraction. It gave, as it saw them to be, the reasons for the reigning furore. Enthusiasm for the new, the impressively scientific, and the elation in the consciousness of being up to the minute, explain in large measure the prevailing frame of mind. Nor is The Journal retrograde. It appreciates very fully the laboratory and clinical revela-

tions of the last decade or generation. It also appreciates other observations and revelations.

There is an element of truth too strong for suppression in the statement that "history repeats itself." We have seen successive waves of scientific procedure and enthusiasm die upon the shore of practical experience. We have looked upon the complicated mechanism of a final therapeusis in offices when the reigning deity would brook no question of its efficacy. Later we have looked and missed the shining apparatus as well as the eye-glow of the old confidence and pride. We asked no questions, made no remark; silence was courtesy.

We have further seen, and that recently, the lasting evidence of careful, conscientious work performed when our fathers were young. At that time they were not discussing 100% extraction and when the labor of love was done, likely enough, they were not thinking of reward. One can't well sense with digital nerve ends the idiosyncracies of a root-canal and reflect at the same time on reward. The major portion of reward came when the penetrating ray of modern science after one generation, mind you, reported "all's well" at the root apex. Nor are all the canals perfectly filled where after years of physiological behavior the apex is apparently undisturbed. To all appearances the tissue accepted in friendship what was done. And facts like this, seen for the looking, are observed in other departments of operative dentistry. Are such facts voiceless, weightless, valueless in our scientific time? Are they mute or are we deaf?

Another fact obtrudes. We listen patiently to many papers and more discussions on multitudinous subjects. Over and over again chemistry, organic and physiological is presented and a listening chemist, distressed, leaves. Then it is bacteriology or histology or mayhap surgery and an attentive specialist in one of these, becoming restive, departs. A question at a later time brings the illuminating reply that the essayist was over-stating or mistating or impossibly concluding in many of his assertions. It takes more than a month old inspiration to make a man eligible to an opinion where these subjects are involved. Confidence then in definitions, diagnoses, formulae, procedures, weakens.

Within two years, dentistry has given rise to a crop of oral surgeons: blame the war. The major part of the surgery that falls to the hands of the parvenu operators is extraction. It was symptomatic that at a recent meeting of farthest reaching importance, the surgical clinics were crowded beyond precedent and the preventive-measure clinics were, by comparison, conspicuously unobserved. This circumstance was the culminating stimulus to this editorial. We know that to the multitude reaching for surgical honors, surgery means extracting. Here, doubtless, history will repeat. Honors will, in a near day, be to

the man who bent his energy to conservation of teeth that no genius has as yet duplicated. Satisfaction will be to the man who was not swept beyond the limit of reason and extracted for the applause of it. The value of teeth will return for emphasis and skill and efficiency in therapeusis will be cause for pride. We are led to feel that perhaps the difficulty of the one task and the ease of the other offers an explanation.

Again *The Journal* would emphasize that it is not reactionary. It believes in extraction when thoro analysis and judgment dictate that indications all point removal-ward. What we cannot do is consent to the removal of teeth on conjecture or for experimental purposes or offer extraction as a stepping stone to those who aspire to surgery. There is a better way. We urge that for the sake of the patient whom we often injure with only a poor and partial recompense that we spend more scientific activity on the at present difficult problem of root-treatment and tooth conservation.

We believe, and that with great positiveness, that the time will come when more trustworthy diagnoses, better understanding, more perfect methods will be at the disposal of operators for the treatment of teeth. The time is now here when the employment of simple, rudimentary antiseptic methods by large numbers of our profession would eliminate much of the lamentable aftermath of root-canal work. When the day of judgment and wisdom arrives, the conscientious man who injudiciously extracted with unrestraint because a tooth was pulpless and because the action carried a pseudo scientific impress will have full opportunity for tears, and to say, "I was conscientious in doing it," will afford scant relief because by that time wisdom will answer, "True, but sanity never rides on the pinions of extreme and since maturity, you have been old enough to know it."

EVERY DENTIST SHOULD SUPPORT THE CAMPAIGN AGAINST TUBERCULOSIS.

Between the dates of December 1 and 11 the National Tuberculosis Association and its 1200 affiliated state and local associations will appeal to the people of the United States for the support of the non-official, voluntary tuberculosis campaign machinery.

Within the last ten years the group of people who are appealing for support have developed the campaign against tuberculosis from almost nothing to the largest and best organized public health movement in America. The relatively small sums of money raised from the Christmas Seal sales have been multiplied by propaganda and have produced from public funds hundreds of millions of dollars for the support of the tuberculosis campaign.

The dentist is a valuable ally of the tuberculosis movement. No more potent cooperation with the dentist has been given than that of the Modern Health Crusade, directed by the tuberculosis campaign, where the toothbrush and clean mouth have been one of the rules taught to over six million school children.

THE FRUITS OF QUACKERY.

One of the best hotels in a great city, towering high on a beautiful boulevard, almost within the business district and yet overlooking the lake! In a beautiful suite high up, away from the noisy bustle of the city, sits a kindly looking gray-haired man. A touch of the wall buttons brings servants scurrying to do his bidding, for he is free with tips and his smile. At his word a seven-passenger Peugeot, of the latest model, guided by a uniformed chauffeur, rolls up to the entrance. He wishes, perhaps, to attend the theatre or to take an airing in the park or to see a friend. Not too often the latter, for he has few friends! The transient guests inquire of the clerk as to his identity. Perhaps he is a member of some foreign leaurels of some gigantic deal in copper or in cotton! But no! It appears he made his fortune by selling sugar and salt. A pinch of salt and a pinch of sugar in a barrel of hydrant water guaranteed to cure any disease if the sufferer will only put one drop in each eye night and morning—approximate cost, 6 cents a gallon—selling price, $5 an ounce! Through the Middle West, in little country graveyards, are the bodies of some who read the advertisements and believed. And the "professor" orders out his car and says to the chauffeur with a lordly wave of his hand: "To the park, James." The mills of the gods grind slowly....obviously.

—*Editorial from A. M. A., Oct. 2.*

MEDICAL JOURNAL URGES M. D'S TO REFUSE PERMITS.

The following is from The Journal of the American Medical Association for July 24:

"A gynecologist was speaking. 'No,' he said, 'I haven't taken out a permit. In twenty years of practice I have yet to find a case in which I could be sure whiskey was beneficial. Not having a permit makes it easy for me to turn down requests from my intimate friends and patients.'

"Then the opinions of a well-known internist, a pediatrician, a surgeon, and some general practitioners were sought. None of them, with the exception of one of the latter, had taken out a permit. He had given ten prescriptions in three months, and he admitted—not for publication—that in nine instances the prescription was written at the patient's request, and in the tenth something else would have served.

"Don't subject yourself to temptation; don't hurt the feelings of your patient or of a very particular friend by refusing to write a 'prescription' when he pleads for one. Have a good excuse for not doing so. The easiest way is not to have a 'permit,' much less a book of blank prescriptions."

OHIO STATE DENTAL SOCIETY.

The fifty-fifth annual meeting of the Ohio State Dental Society will be held in Memorial Hall, Columbus, November 30, December 1 and 2. There will be three full days of papers and clinics, closing Thursday evening.

A cordial invitation is extended to members of other state societies to meet with us and it is urged that hotel reservations be made early.

F. R. CHAPMAN, Secretary,
305 Schultz Bldg., Columbus, O.

CHICAGO DENTAL SOCIETY.

January 27th, 28th, 29th, 1921, are the dates of the fifty-seventh anniversary meeting of the Chicago Dental Society. A cordial invitation is extended to members of all recognized dental societies.

M. M. PRINTZ, Secretary,
25 E. Washington St., Chicago, Ill.

COLORADO STATE DENTAL BOARD.

The Colorado State Board of Dental Examiners will meet for the purpose of examining candidates for license to practice Dentistry and Oral Hygiene in Colorado, at Denver, Colorado, at the State House, beginning December 7, 1920, 8 a. m.

For further particulars and application blanks, address,

DR. R. C. QUICK, Secy.,
310 Metropolitan Bldg.,
Denver, Colorado.

SEVENTH DISTRICT DENTAL SOCIETY OF THE STATE OF NEW YORK.

The mid-year meeting of the Seventh District Dental Society of the State of New York will be held Saturday, November 20, at the Rochester Dental Dispensary, Rochester, N. Y.

F. J. SHADDOCK, Secretary,
605 C. of C. Bldg., Rochester, N. Y.

SOUTH DAKOTA STATE BOARD OF DENTAL EXAMINERS.

The next meeting of the South Dakota State Board of Dental Examiners will be held in Sioux Falls, South Dakota, January 11th, 12th, 13th and 14th, 1921, beginning promptly at 9:00 A. M., January 11th.

All applications must be in the hands of the Secretary by January 1st. Fee for examination, $25.00. No reciprocity or interchange. Full information and application blanks may be received by addressing

L. R. WALSTON, Secretary,
Redfield, So. Dak.

OKLAHOMA STATE BOARD MEETING.

Next examination December 27, 1920, Senate Chamber State Capitol Bldg., Oklahoma City, L. M. Doss, Secretary-Treasurer, 245 American National Bank Bldg. No reciprocity, no temporary license.

NEW MEXICO BOARD OF DENTAL EXAMINERS.

The New Mexico Board of Dental Examiners will hold a meeting in Albuquerque, beginning February 7th, 1921, for the examination of applicants. All applicants must take the examination. For blanks and rules governing examination address,

M. J. MORAN, Secretary,
Deming, New Mexico.

MONTANA STATE BOARD OF DENTAL EXAMINERS.

The next meeting of the Montana State Board of Dental Examiners will be held in Helena, beginning the second Monday in January. Applications must be in the hands of the Secretary not later than January 1st.

For further information, apply to

FRANK J. BELL, Secretary,
Box 425, Billings, Montana.

KANSAS STATE DENTAL BOARD MEETING.

The next meeting of the Kansas State Board of Dental Examiners will meet at Throop Hotel, Topeka, Kansas, Dec. 6th, beginning at 7:30 P. M. For further information and application blanks, write the undersigned.

G. F. AMBROSE, Secretary,
Eldorado, Kan.

ANNUAL MEETING OF DENTAL PROTECTIVE ASSOCIATION.

The annual meeting of the Dental Protective Association of the United States, will be held in the Palmer House, State and Monroe Streets, Chicago, on the third Monday of December, the 20th, 1920, at 4 P. M., sharp.

The report of the officers will be given, a Board of Directors will be elected and such other business transactions as should come before the Association.

All members are urgently requested to be present.

By order of the Board of Directors,

J. G. REID, President,
E. W. ELLIOT,
Vice-President and Secretary.
D. M. GALLIE, Treasurer.

IDAHO DENTAL EXAMINATION.

The next examination for dentists will be held in this office on January 11, 1921. For application blank and law pertaining to this profession, address Bureau of License, Boise, Idaho.

PAUL DAVIS, Director.

R. O. T. C. IN TEN CLASS A DENTAL SCHOOL.

The Secretary of War has approved the recommendation of the surgeon general for the establishment of R. O. T. C. units in ten class A dental schools thruout the country. The selection of the schools has been made geographical in order to cover the continental limits. The schools selected are the dental departments of the University of California, the North Pacific University, Northwestern University, University of Minnesota, University of Michigan, University of Pittsburgh, University of Pennsylvania, Harvard University, Vanderbilt University and St. Louis University. Most of these dental schools are connected with universities where there are already R. O. T. C. units established and some of them have medical corps units. Under the plan adopted, the first two years' course of instruction, freshman and sophomore, may be carried on by any medical department officer assigned to the duty at these institutions, but the advance course of the junior and senior years will be conducted by a dental officer inasmuch as the subjects taken up will pertain largely to the practice of military dental surgery. It is expected

that the majority of class A dental schools thruout the country will make a request for the establishment of these units.—*Army and Navy Register, October 2.*

DENTAL CORPS ORDERS FROM WAR DEPARTMENT.

Dental Corps.

Capt. William T. Williams from duty with 1st Division, Camp Taylor, Ky., to Camp Dix, N. J., 1st Division, for duty.

Capt. Robert E. Motley from duties at Camp Dix, N. J., to Washington and report to attending surgeon for duty.

Capts. William A. Spence, Walter J. Allison, Edward M. Atkinson, 1st Lieuts, Frederick J. Marshall, Clarence C. Olson, John Grega, Jr., Oscar R. Charles, William Simone, John T. Cosler, James C. Williams, Charles A. Shaw, James P. D. Mason, honorably discharged.

1st Lieut. Arthur E. Brown from duty at Fort Porter, N. Y., to Baltimore, Md., 3d corps area, for duty.

—*Army and Navy Register, October 2.*

Capts. Raymond F. Mulcahy, Solomon J. Z. Gantz, William W. McCrillis, 1st Lieut. Clarence R. Benney honorably discharged.

—*Army and Navy Register, October 9.*

Capt. Edwin St. Clair Wren from duties at Camp Dix, N. J., to Baltimore, Md., 3d corps area, for duty.

Capt. Roy M. Kisner from duties at Camp Grant, Ill., to Fort Benjamin Harrison, Ind., 5th corps area, for duty.

First Lieut. Ralph O. Leonard from duty at Chicago to Camp Grant, Ill., for duty.

—*Army and Navy Register, October 16.*

Capts. William S. Shuttleworth, George A. Cloutier, Jr., Elmer J. Nieder, John F. Ackley, 1st Lieuts. Julius W. Sipple, William J. Mackey, Jr., Guy H. Jones.

—*Army and Navy Register, October 23.*

PATENTS OF INTEREST TO DENTISTS.

1323743, Dental bridge, Henry Callsen, Brooklyn, N. Y.

1323832, Dental bridge tray, Isidor Chige, New York, N. Y.

1323585, Dental implement, Walker A. Edwards, Jr., Austin, Texas.

1323697, Means for measuring teeth, Jesse C. King, La Junta, Colo.

1323420, Electric lamp for dental and other uses, Arthur Sutter, Annecy-Albigny, France.

1324331, Dental bridge-work, Ramon G. De la Beldad, New York, N. Y.

1324660, Centrifugal casting machine, Philip L. Gill, Englewood, N. J.

1324429, Mechanical articulator and grinder, Homer Mannon, H. M. Brown, and R. G. Perkins, Huntington, W. Va.

1324319, Dental articulator, James M. O'Keefe, Brooklyn, N. Y.

1324173, Combined toothbrush and powder holder, Richard Ross, Waterville, Wash.

1324521, Dental plate, Stephen V. Rowbitzky, Washington, D. C.

1324476, Denture attaching device, Samuel G. Supplee, New York, N. Y.

1324526, Dental inlay casting machine, Wm. G. Tonkinson and A. G. Hausen, St. Louis, Mo.

1325498, Rotary toothbrush, Sidney Kaneye, Foleyet, Canada.

1325447, Attachment for dental engines, Vincent J. Luongo, Brooklyn, N. Y.

1325268, Toothbrush, Lorenz Sosdian, New York, N. Y.

1325426, Dental instrument, William Watson, Glasgow, Scotland.

1326053, Tooth powder can and other can for powder, Frederick G. Henry, Portland, Oregon.

1326689, Dental instrument, David H. Payne, Decatur, Texas.

1326638, Toothbrush, Louis A. Block, New York, N. Y.

1326336, Molding flask, Julius M. Germanson, Milwaukee, Wis.

1326552, Temporary dental cement or stopping, Clarence C. Vogt, Pittsburgh, Pa.

1326900, Toothbrush, Ulfert L. Albers, Rico, Colo.

Copies of above patents may be obtained for twenty-five cents each, by addressing John A. Saul, Solicitor of Patents, Fendall Building, Washington, D. C.